R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
REFRIGERATION AND AIR CONDITIONING
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a) What is the difference between Refrigeration and Air Conditioning? [2]
  b) Draw the line diagram of simple vapour compression refrigeration system. [3]
  c) What are the advantages of multistage compressor? [2]
  d) What are different types of expansion devices [3]
  e) Discuss the advantages of the dense air refrigerating system over an open air refrigeration system. [2]
  f) What are desirable characteristics of absorbent in vapour absorption refrigeration cycle? [3]
  g) Prove that the partial pressure of water vapour in the atmospheric air remains constant as long as the specific humidity remains constant. [2]
  h) Distinguish sensible and latent heat loads. [3]
  i) Classify Air conditioning systems. [2]
  j) Distinguish clearly fan and blower. [3]

PART - B
(50 Marks)

2.a) Mention the limitations of Simple vapour compression refrigeration cycle.
  b) Briefly explain the working of two stage compression with water intercooler and liquid sub-cooler employed for vapour compression system. [5+5]

OR

3.a) Explain the construction and use of P-H charts in refrigeration system.
  b) Define C.O.P. How C.O.P of refrigerators and heat pump can be evaluated? Explain. [5+5]

4.a) How does an actual vapour compression cycle differ from that of a theoretical cycle?
  b) A vapour compression refrigeration machine, with Freon-12 as refrigerant, has a capacity of 12 tonne of refrigeration operating between -28^0C and 26^0C. The refrigerant is sub cooled by 4^0C before entering the expansion valve and the vapour is superheated by 5^0C before leaving the evaporator. The machine has a six-cylinder single-acting compressor with stroke equal to 1.25 times the bore. It has a clearance of 3% of the stroke volume. Determine (i) Theoretical power required, (ii) C.O.P, (iii) Volumetric efficiency, (iv) Bore and stroke of cylinder. The speed of compressor is 1000 r.p.m. the following properties of Freon-12 may be us. [5+5]

OR

5.a) Explain the working of following types of evaporators with neat sketches:
(i) Flooded evaporator, (ii) Natural convection evaporator.

b) Give the comparison between air cooled and water cooled condenser. [5+5]

6. An air refrigerator working on Bell-Coleman cycle takes in air at 1 bar and at a temperature of 10^0 C. The air is compressed to 5 bar abs. The same is cooled to 25^0 C in the cooler before expanding in the expansion cylinder to cold chamber pressure of 1 bar. The compression and expansion laws followed are $PV^{1.35} = C$ and $PV^{1.3} = C$ respectively. Determine C.O.P of the plant and net refrigeration effect per kg of air. Take Cp = 1.009 kJ/kg K and R = 0.287 kJ/kg K for air. [10]

OR

7. A Two stage ammonia refrigeration system operates between overall pressure limits of 15 bar and 2 bar respectively. The liquid is sub-cooled to 30^0C. The temperature of superheated vapour leaving the water intercooler is also 30^0C. The flash chamber separates the dry vapour at 5 bar pressure. The liquid refrigerant then expands to 2 bar, the evaporator pressure. The load on the evaporator is 50 kW. Calculate a) Mass flow rate in different lines b) Power required c) COP. [10]

8.a) Explain the procedure for calculating cooling load due to infiltration air.

b) A summer air conditioning system for a small office building is to be designed. The design is to be based on the following information:
Outside design condition 35^0C Tdb, 28^0C Twb
Inside design condition 26^0C Tdb, 50% RH
Room sensible heat gain 45 kW
Room latent heat gain 9 kW
Ventilation air 0.95 m^3/s
A four row direct expansion refrigerant 134a coil with bypass factor of 0.2 is to be used. Analyze the problem on a psychometric chart and determine the following:
i) The room apparatus dew point (ADP)
ii) The temperature of the air leaving the coil
iii) The total quality of air required (m^3/s). [5+5]

OR

9. The following data apply to an air conditioning system:
Room sensible heat =41868 kJ/hr(11.63 kW); room latent heat=41868 kJ/hr(11.63kW); inside design condition= 25^0C, 50% RH, outside design condition=35^0C, DBT; 27.8 WBT. Return air from the room is mixed with the outside air before entering the cooling coil in the ratio of 4:1. Return air from the room is mixed with the cooling air, i.e. after the cooling coil in the ratio of 1:4. Cooling coil by pass factor is 0.1. The air may be reheated if necessary before supplying to the conditioned space. Assume ADP as 10^0C and determine,
a) Supply air conditions into the room
b) Refrigeration load due to the reheat
c) Total refrigeration capacity
d) The quantity of fresh air supplied. [10]

10.a) Explain the use of HEAT PUMP for heating and cooling cycle with neat diagram.

b) Explain in detail different components of fans. [5+5]

OR

11.a) Describe a centrifugal fan with the help of a neat sketch.

b) Explain in detail about heat pump circuits. [5+5]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
INFORMATION SECURITY
(Computer Science and Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	Define Non Repudiation.	[2]
b)	Write a short notes on steganography.	[3]
c)	Define linear cryptanalysis.	[2]
d)	Discuss about Electronic code book mode?	[3]
e)	Define Message Authentication Code.	[2]
f)	Illustrate about biometric authentication.	[3]
g)	What is IP Security?	[2]
h)	Discuss about the concept of combining security associations.	[3]
i)	What is Firewall?	[2]
j)	Write short notes on virtual elections.	[3]

PART - B

(50 Marks)

2. Compare and Contrast between Symmetric and Asymmetric key cryptography. [10]

OR

3. Give an example to explain the concept of transposition ciphers in detail. [10]

4. With a neat diagram explain how encryption and decryption are done using Blowfish algorithm? [10]

OR

5. Given two prime numbers p=5 and q=11, and encryption key e=7 derive the decryption key d. Let the message be x=24. Perform the encryption and decryption using R.S.A algorithm. [10]

6. Give a neat sketch to explain the concept of Secured Hash Algorithm (SHA). [10]

OR

7. Client machine C wants to communicate with server S. Explain how it can be achieved through Kerberos protocol? [10]

8. How the messages are generated and transmitted in pretty good privacy (PGP) protocol? Explain with clear diagrams. [10]

OR

9. Draw the IP security authentication header and explain the functions of each field. [10]

10. Explain the steps involved in performing Secure Inter-branch Payment Transactions. [10]

OR

11. List the characteristics of a good firewall implementation? How is circuit gateway different from application gateway? [10]

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R13

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a)	Which type of operation indicated by status lines of 8086?	[2]
b)	What are the capabilities of I/O address lines of microprocessor?	[3]
c)	Define the term macro's.	[2]
d)	Give the advantages of assembly language over machine language.	[3]
e)	Define the term Interrupt.	[2]
f)	List out the difference between static and dynamic memories.	[3]
g)	What is the function of Port 3 of 8051 microcontroller?	[2]
h)	What is the function of clock generator of 8051? What are the signals are used for clock in 8051.	[3]
i)	What is the function of Timer?	[2]
j)	How does effect the SBUF SFR in serial communications of 8051?	[3]

PART - B
(50 Marks)

2.a) Draw and explain the each bit of flag register of 8086 family microprocessor.
 b) Describe the implementation of pipelined process of 8086.   [5+5]

OR

3.a) Draw and explain the read and write cycle timing diagrams of 8086 in maximum mode.
 b) Explain the physical memory organization of 8086 system.   [6+4]

4. Enlist the addressing modes of 8086 and describe briefly each addressing mode with one example.   [10]

OR

5. Explain the all assembler directives of 8086 with suitable examples.   [10]

6.a) Interface Eight 8K RAM chips and Four 8K×4 EPROM chips with 8086 so as to form a completely working system configuration.
 b) Explain the interfacing procedure of an 8-bit ADC with 8086 microprocessor.   [5+5]

OR

7.a) Explain the briefly the different modes operation of 8255 PPI.
 b) Draw and explain the synchronous mode transmitter and receiver data formats of 8251.
                                                                                [5+5]

8. Draw and explain the internal architecture of 8051 family microcontroller and explain each block of it. [10]

OR

9.a) Describe briefly the register set of 8051 microcontroller.
  b) Explain the importance of data transfer type instructions of 8051. [5+5]

10. Draw and explain the following SFRs. [5+5]
   a) IE   b) IP

OR

11.a) Write and explain the instructions to read the SBUF eight times with an interval of 0.33ms and save the results between the R0 and R7 of the register bank 0.
   b) How does the timer overflow interrupt differ from real time clocked interrupts? Discuss in detailed. [5+5]

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R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
STATIC DRIVES
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART – A

(25 Marks)

1.a) What are the advantages of three phase converters over single phase converter? [2]
  b) Draw the schematic diagram of a Electrical Drive System. [3]
  c) Draw dual converter fed d.c motor? [2]
  d) State the advantages of closed loop of operation d.c drives. [3]
  e) Mention the advantages of chopper fed drives. [2]
  f) What are the different types of control strategies in a D.C chopper? [3]
  g) What are the advantages of static Kramer drive? [2]
  h) What is meant by V/F control? [3]
  i) What do you mean by PWM technique? [2]
  j) What are the advantages of self control of synchronous motor? [3]

PART – B

(50 Marks)

2.a) Explain the concept of constant torque control and constant power control.
  b) A single phase half controlled converter is fed from a 120V, 60Hz supply and provides a variable dc voltage at the terminals of a d.c motor. The thyristor is triggered continuously with a firing angle of $\alpha = 60^0$. Resistance of armature circuit is 10Ω. The motor speed is considered constant so back emf is 60V. Find the value of armature current, neglecting armature inductance. [5+5]

OR

3.a) Explain the operation of dc separately excited motor fed by 1-ϕ full converter during motoring mode.
  b) Explain the speed-torque characteristics of separately excited d.c motor connected to three phase semi controlled converter. [4+6]

4.a) Explain the concept of plugging in separately excited d.c motor.
  b) Explain the four quadrant operation of d.c.motor by dual converter. [4+6]

OR

5. Explain the concept of Rheostat braking in (a) Separately excited d.c. motor (b) Series excited d.c motor. [5+5]

6.a) Deduce the mathematical expression for minimum and maximum currents for class A chopper operated d.c motor with back emf.

b) A separately excited dc motor with armature resistance of 0.01Ω with dc supply 220V, 100A, 1000rpm is fed with chopper control for its motoring operation. Calculate the duty ratio of chopper at rated torque with speed of 500rpm for its motoring operation. [6+4]

OR

7.a) Explain the operation of four-quadrant type chopper.

b) A 230v separately excited dc motor takes 50A at a speed of 800rpm. It has armature resistance of 0.4Ω. This motor is controlled by a chopper with an input voltage of 230V and frequency of 50hz. Calculate the speed of regenerative braking operation at duty ratio of 0.4. [6+4]

8.a) Describe the control of 3-ϕ I.M by using A.C voltage controller.

b) Explain with suitable block diagrams the various types of VSI – controlled Induction motor drive. [5+5]

OR

9.a) Explain static rotor resistance technique to control the speed of wound rotor induction motor.

b) Explain concept of Slip Power recovery. [6+4]

10.a) Explain the closed loop control of CSI fed synchronous motor drives.

b) Explain the cycloconverter fed synchronous motor drive. [5+5]

OR

11.a) Discuss the various methods of speed control of synchronous motor in detail.

b) Describe the speed control of synchronous motor using VSI. [5+5]

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R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
FOUNDATION ENGINEERING
(Common to CEE, CE)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a) Define the following term: Inside and Outside Clearance, Area Ratio. [2]
  b) What is the purpose of soil exploration? [3]
  c) Distinguish between infinite and finite earth slopes. [2]
  d) An infinite slope, $C' = 0$, $\varphi = 34^0$ and water table may occasionally rise to the surface with $\gamma_{sat} = 18 KN/m^3$, factor of safety = 1.5. What will be minimum stable slope? [3]
  e) What is the depth of tension crack in soft clay for $\varphi = 0^0$ if $C = 100$ kpa and $\gamma = 20$ kn/m^3. [2]
  f) To have zero active pressure intensity at the tip of a wall in cohesive soil one should apply a uniform surcharge intensity. Find the value of the surcharge intensity if soil has $\varphi = 30^0$ and $C = 100$ kpa. [3]
  g) What is the difference between local, general, punching shear failures? [2]
  h) What is negative friction? In what conditions it develops? Explain it with a neat sketch. [3]
  i) Mention the Steps involved in construction of well foundations. [2]
  j) Explain the component of well foundations with the help of neat sketch. [3]

PART - B
(50 Marks)

2.a) What are the different civil engineering projects where subsurface investigation is required? What kind of information is required in these investigations?
  b) What do you mean by the 'significant depth of exploration'? Give two empirical guidelines which enable the determination of the depth of exploration. [5+5]

OR

3.a) What are the corrections that must be applied to the field N-value for sand before they are used in design charts and empirical correlations?
  b) What are the circumstances which make the plate load test data misleading when used for extrapolation of prototype behavior?
  c) What is meant by:
  i) Undisturbed sample
  ii) Representative sample
  iii) Recovery ratio. [3+3+4]

4.a) A 40^0 slope is excavated to a depth of 10m in a deep layer of saturated clay of unit weight 20 kN/m³, the shear parameters are Cu=72 kN/m², φ=0. The rock edge is at a greater depth. The Taylor's stability number is 0.18. Find the factor of safety?

b) If there is a sudden draw down of water in canal and is Sn for reduced value of φu is 0.126 then what is factor of safety with respect to cohesion against failure.

c) What are the probable types of failure of a slopes? Define the various factors of safety used in the analysis of stability of slopes. [4+3+3]

OR

5.a) An infinite slope with an inclination of 35^0 is subjected to seepage parallel to its surface. The soil has C'=100 KN/m² and φ'= 30^0 using concept of mobilized cohesion and friction at a factor of safety of 1.5 with respect to shear strength. What is mobilized friction angle?

b) An infinite slope of C-φ soil with C = 20 kPa, γd =16 kN/m³, and inclination angle 40^0 and critical height of 5m. To maintain limiting equilibrium, what will be internal angle of friction?

c) What is the difference between the total stress methods and effective stress methods of stability analysis? [4+3+3]

6.a) A retaining wall 4m high, with vertical back supports a backfill with horizontal ground surface. The soil has unit weight of 18kN/m³ and angle of internal friction of 35^0. The angle of wall friction may be taken as 20^0. A footing, running parallel to the retaining wall and carrying a load intensity of 18kN/m, is to constructed. Find the safe distance of the footing from the face of the wall so that there is no increase in lateral pressure on wall due to the load of footing.

b) What is the order of horizontal strain and the amount of translatory movement at the top required to produce active state in Coarse-grained soils and fine-grained soils behind a retaining wall? [5+5]

OR

7.a) Discuss the stability analysis of retaining walls.

b) Clearly explain the difference between the active and passive earth pressure. Give two example of each kind.

c) For a clay backfill behind a retaining wall, what is the depth of tension crack? How is the total active earth calculated? [4+3+3]

8.a) What are the basic characteristics of the failure mechanism in general, local and punching shear failure? Explain in detail.

b) Using Terzaghi theory, find the ultimate bearing capacity for a square footing of 2m × 2m placed at depth of 1.2m below the ground on a pure cohesive soil having density 18kN/m³ Nc = 5.7. Use local shear failure condition. Unconfined compressive strength = 120kN/m².

c) A SPT is conducted in staturated coarse silty soil with Ysat = 18kN/m³ at a depth of 5m has yield at N-value of 20. Find the corrected N-value for the design of foundation, if the depth of water table at the time of test was 2m. [3+4+3]

OR

9.a) What are the assumptions made in the Terzaghi's bearing capacity theory? Derive an expression for bearing capacity.

b) A plate load test was conducted in a sandy soil with a plate of size 0.3m × 0.3m .The ultimate load per unit area was found to be 2kg/cm². Calculate the allowable load for a footing of size 2m × 2m. Using FOS=3.

c) What is the safe bearing capacity of a rectangular footing 1m×2m, placed at a depth of 2m in a saturated clay having unit wt. 20kN/m³ and unconfined compressive strength 100kpa. Assume a FOS=2.5. Use skempton theory.   [3+3+4]

10.a) What considerations govern the fixing of the depth of a well foundation?

b) What are the various forces acting on the well foundation? Explain with neat sketch.

c) Explain the factor that influence the depth of well foundation.   [3+4+3]

OR

11.a) What is meant by well foundation? Explain various types and components of a well foundation.

b) State the IS and IRC specifications for the grip length of a well foundation.

c) What is meant by sinking of well. Explain the method of sinking well with a neat sketch.   [3+3+4]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
DESIGN OF MACHINE MEMBERS-II
(Mechanical Engineering)

Time: 3 hours
Max. Marks: 75

Answer any five questions
All questions carry equal marks

Assume suitable data if necessary
Design data book is permitted in the examination hall

1. A journal bearing of 50 mm diameter and 80 mm long, has a bearing pressure of 6 N/mm^2. The speed of the journal is 1000 r.p.m.The ratio of journal diameter to the diametral clearance is 1000. The bearing is lubricated with oil, whose absolute viscosity at the operating temperature of 75^{0}C may be taken as 0.015kg/m-s. The room temperature is 25^{0}C. Determine
   a) The amount of artificial cooling required, and
   b) The mass of the coolant oil required, if the difference between the outlet and inlet temperatures of the oil is 25^{0}C. The specific heat of the oil is J/kg/^{0}C. Heat dissipation coefficient = 500 W/m^2/^{0}C.   [15]

2. A ball bearing operates on the following work cycle:

Element No	Radial load (N)	Speed(r.p.m)	Element time (%)
1.	3000	720	30
2.	7000	1440	40
3.	5000	900	30

   The dynamic load capacity of the bearing is 16600N. Calculate
   a) The average speed of rotation;
   b) The equivalent radial load;
   c) The bearing life.   [15]

3. Design a suitable connecting rod for a petrol engine. The following data is available:
   Piston diameter   = 100mm.
   Weight of reciprocating parts per cylinder   = 2.25kg
   Length of the connecting rod , centre to centre = 300mm
   Rated rpm of the engine   = 1800
   Compression ratio   = 6:1
   Maximum explosion pressure   = 3.15MPa
   Maximum possible over speed   = 2400
   Bearing pressure for big end   = 7MPa
   Bearing pressure for small end   = 14MPa
   Draw a dimensioned drawing showing provision for lubrication.   [15]

4.a) What are the three basic elements of chain drive?
  b) Power of 60kW at 750 rpm is to be transmitted from an electric motor to compressor shaft at 300 rpm by v belts. The approximate larger pulley diameter is 1500mm. the approximate center distance is 1650mm, and overload factor is to be taken as 1.5 give a complete design of the belt drive. A belt with cross sectional area of 350mm^2 and density a1000kg/m^3 and having an allowable tensile strength 2 MPa is available for use. The coefficient of friction between the belt and the pulley may be taken as 0.28. The driven pulley is overhung to the extent of 300mm from the nearest bearing and is mounted on a shaft having a permissible shear stress of 40MPa with the help of a key. The shaft, the pulley and the key are also to be designed. [3+12]

5.a) Why dynamic load is induced in the gear teeth ? Explain the procedure of designing for dynamic load using Buckingham equation.
  b) Design and draw spur gear drive transmitting 30kW at 400 r.p.m. to another shaft running approximately at 1000 r.p.m. The load is steady and continuous. The material for the pinion and gear are cast steel and cast iron respectively. Take module as 10 mm. Also check the design for dynamic load and wear [3+12]

6.a) What is the herringbone gear? Where are they used?
  b) A helical cast steel gear with 30^0 helix angle has to transmit 35kW at 2000 r.p.m. If the gear has 25 teeth, find the necessary module, pitch diameters and face width for 20^0 full-depth involute teeth. The static stress for cast steel may be taken as 100MPa. The face width may be taken as 3 times the normal pitch. The tooth form factor is given by expression $y = (0.154-0.912 / T_E)$, where T_E represents the equivalent number of teeth. The velocity factor is given by $Cv = 6/ (6+V)$ where V is the peripheral speed of the gear in m/s. [3+12]

7. A double square thread power screw with ISO metric trapezoidal threads, is used to raise load of 300kN. The nominal diameter is 100mm and the pitch is 12mm. The coefficient of friction at screw threads, is used to raise a load of 300kN. The nominal diameter is 100mm and the pitch is 12mm. The coefficient of friction at screw threads is 0.15. Neglecting collar friction, calculate
  a) Torque required raising the load
  b) Torque required lowering the load and
  c) The efficiency of the screw. [5+5+5]

8.a) What are the advantages and disadvantages of worm gear drives over other gears.
  b) The input to worm gear shaft is 18kW and 600 rpm. Speed ratio is 20. The worm is to be of hardened steel and the wheel is made of chilled prosper bronze. Considering wear and strength, design worm and worm wheel. [3+12]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
MICROPROCESSORS AND MICROCONTROLLERS
(Common to EEE, ECE, EIE)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) Explain the concept of segmented memory? What are its advantages? Explain the physical address formation in 8086.
  b) Describe the following signaling pins of 8086 microprocessor.   [7+8]
     (i) NMI (ii) READY (iii) QS0 (ALE) (iv) $\overline{TEST}$ (v) MN/$\overline{MX}$

2.a) What is an assembler directive? Explain the following assembler directives:
     (i) ASSUME (ii) EQU (iii) LABEL (iv) OFFSET
  b) Write an 8086 assembly language program to find out the number of positive numbers and negative numbers from a given series of signed numbers.   [7+8]

3.a) Explain the control word format of 8255 in I/O and BSR mode.
  b) Explain the A/D converter interfacing to 8086 microprocessor.   [7+8]

4.a) With the help of the internal block diagram, explain the working of 8259 priority interrupt controller.
  b) Explain the various hardware and software interrupts in 8086 microprocessor.   [8+7]

5.a) Explain Synchronous and Asynchronous data transfer with examples.
  b) Give an overview of RS-232C serial data standard.   [7+8]

6.a) Explain how the memory space in the internal RAM of 8051 is organized using a diagram?
  b) Explain the register direct and register indirect addressing modes of 8051 with suitable examples.   [7+8]

7.a) Describe the various timer modes of operation in 8051.
  b) Explain the standard 8-bit UART mode of serial data communication in 8051. What is the value loaded in the timer 1 registers to obtain a baud rate of 9600 bps.   [7+8]

8.   Explain briefly about the I/O ports, timers, UART, and interrupt structure for a 8-bit AVR family microcontroller.   [15]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
GEOTECHNICAL ENGINEERING-II
(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) Enumerate the various methods of soil exploration and mention the circumstances under which each is best suited. What do you mean by undisturbed sample?
  b) Explain with a neat sketch the construction and use of a split spoon sampler.   [8+7]

2.a) Describe a suitable method of stability analysis of slopes in (i) purely saturated cohesive soil, (ii) cohesionless sand.
  b) Under what conditions (i) a base failure and (ii) a toe failure are expected? Explain.
  c) Critically discuss the basic assumptions made in the stability analysis of slopes.[5+5+5]

3.a) Differentiate critically between Rankine and Coulomb theories of earth pressure.
  b) A retaining wall with a smooth vertical back, 4.5 m high, retains a dry cohesionless backfill level with the top of the wall. The unit weight of soil is 18.6 kN/m^3 and angle of internal friction is 30^0. The backfill carries a uniformly distributed surcharge of 20.6 kN/m^2. Determine the magnitude and point of application of the total active thrust per linear metre of the wall.   [7+8]

4.a) List the various types of retaining walls and write their suitability in the field.
  b) What are the design criteria to be satisfied for the stability of a gravity retaining wall? Indicate briefly how you will ensure the same.   [7+8]

5.a) Discuss the various factors that affect the bearing capacity of a shallow footing. Write brief critical notes on settlement of foundations. How do you ascertain whether a foundation soil is likely to fail in local shear or in general shear?
  b) What is the safe bearing capacity of a circular footing of 1.5 m diameter resting on the surface of a saturated clay of unconfined compression strength of 120 kN/m^2, if the factor of safety is 3?   [8+7]

6.a) Explain the recommended construction practices to avoid deterimental differential settlement in large structures.
  b) A plate load test was conducted on a uniform deposit of sand and the following data were obtained:

Pressure (kPa)	50	100	200	300	400	500	600
Settlement (mm)	1.5	2.0	4.0	7.5	12.5	20.0	40.0

The size of the plate was 750mm×750 mm and that of the pit 3.75m×3.75m×1.5 m. Plot the pressure-settlement curve and determine the failure stress.   [7+8]

7.a) What is the basis on which the dynamic formulae are derived ? Mention two well known dynamic formulae and explain the symbols involved.

b) A pile is driven in uniform clay of large depth. The clay has unconfined compression strength of 90 kPa. The pile is 0.3m diameter and 6m long. Determine the safe frictional resistance of the pile, assuming a factor of safety of 3. Assume the adhesion factor $\alpha = 0.7$. [7+8]

8.a) What are the circumstances under which a well foundation is more suited than other types? Sketch and describe the various components of a well foundation, indicating the function of each.

b) What is 'Grip Length' of well? What are the considerations in the determination of the grip length? [7+8]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year II Semester Examinations, December-2017
CHEMISTRY OF NATURAL DRUGS

Time: 3hours   Max.Marks:75

Answer any five questions
All questions carry equal marks
- - -

1.a)   Write the definition, general methods of extraction of alkaloids.
  b)   Discuss the SAR of morphine and morphine-like analgesics.   [15]

2.a)   Explain reduction of citral to citronellal, citronellol, geraniol and nerol.
  b)   Write the Oxidation of citral to geranic acid. Cyclodehydration of citral to p-cymene.
                                                                                       [15]

3.a)   Explain the reduction of Carvone with different reagents.
  b)   Write the Synthesis of carvone from Limonene/Dipentene and alfa – Terpeneol.   [15]

4.   Discuss the Nomenclature of steroids, structures, stereochemistry and numbering of ring
        system in cholesterol, ergosterol and stigmasterol.   [15]

5.a)   Write notes on Androgens – Testosterone and derivatives. Structure and biological
        activities and uses.
  b)   Comment on Estrogens – estradiol, estrone, estriol. Structures and their interconversion.
                                                                                       [15]

6.   Explain in detail about cortisone and hydrocortisone – Structure, biological actions,
        uses.   [15]

7   Explain in detail the nomenclature, deficiency diseases, structural elucidation of
        thiamine.   [15]

8   Write the structural elucidation of Vitamin E, Riboflavin and its deficiency diseases.
                                                                                       [15]

--ooOoo--

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
AUTOMOBILE ENGINEERING
(Common to ME, MCT)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	Write the types of automobile engines.	[2]
b)	Write the requirements of diesel injection systems.	[3]
c)	Write about antifreeze solutions.	[2]
d)	Briefly write the functions of an ignition system.	[3]
e)	Write the principle of clutch.	[2]
f)	Write about the objects of suspension system.	[3]
g)	Define camber and king pin inclination.	[2]
h)	Write the requirements of brake fluid.	[3]
i)	Write the applications of CNG as alternate fuel.	[2]
j)	Write the demerits of Hydrogen as a fuel for IC Engines.	[3]

PART - B

(50 Marks)

2.a)	Write about engine lubrication.	
b)	Explain about MPFI and GDI Systems.	[5+5]
	OR	
3.a)	Explain the testing of fuel pumps.	
b)	Write about CRDI and TDI Systems.	[5+5]
4.a)	Explain the evaporative cooling system with the help of neat sketch.	
b)	Explain about electronic ignition system using contact breaker.	[5+5]
	OR	
5.a)	Describe about pressure sealed cooling.	
b)	Write about horn, wiper and engine temperature indicator.	[4+6]
6.a)	Explain the working of cone clutch used in an automobile with a neat sketch.	
b)	Write about torsion bar.	[5+5]
	OR	
7.a)	With the help of a neat sketch, explain the construction and operation of a constant mesh gearbox.	
b)	Write about independent suspension system.	[5+5]

8.a) Explain the working of hydraulic brake system with neat diagram.
   b) Write about center point steering and steering linkages. [5+5]

OR

9.a) Write about pneumatic brakes.
   b) Explain about Davis steering mechanism with neat sketch. [5+5]

10.a) Write about the International Pollution standards.
   b) Explain about common rail diesel injection. [5+5]

OR

11.a) Explain the techniques of pollution control.
   b) Write about Biomass, alcohols and LPG as alternate fuels. [5+5]

---ooOoo---

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
OBJECT ORIENTED ANALYSIS AND DESIGN
(Common to CSE, IT)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a)	What is UML?	[2]
b)	Explain annotational things.	[3]
c)	Define class with neat sketch.	[2]
d)	What is relationship? List the types of relationships?	[3]
e)	What is an Usecase?	[2]
f)	Write the common uses of class diagram.	[3]
g)	Write about event.	[2]
h)	Define action states and activity states.	[3]
i)	Mention usecase in Library Management system.	[2]
j)	List out all diagrams in UML.	[3]

PART - B
(50 Marks)

2.a)	Explain in detail about SDLC.	
b)	Summarize common mechanisms in UML.	[5+5]
	OR	
3.a)	Explain about the UML architecture.	
b)	Show basic blocks of the UML.	[5+5]
4.a)	Discuss common modeling techniques of class diagram.	
b)	Explain about structural diagrams.	[5+5]
	OR	
5.a)	Discuss about types and roles.	
b)	Define an object. Mention common uses of objects.	[5+5]
6.a)	Explain the following:	
	i) Links　　ii) Messages	
b)	Discuss Interaction diagrams.	[6+4]
	OR	
7.a)	Explain common modeling techniques of sequence diagram.	
b)	Explain the following with an example:	[4+6]
	i) usecase　　ii) Actor　　iii) flow of events	

8.a) Explain about modeling interprocess communication.
 b) Compose the state chart diagram for unified library application. [5+5]

OR

9.a) What are components? Show the stereotypes that apply to components.
 b) Explain about Deployment diagram with an example. [5+5]

10.a) Construct usecase diagram for the Library application.
 b) Distinguish between patterns and frameworks. [5+5]

OR

11.a) Draw the interaction diagram for login usecase in library application.
 b) Compose the activity diagram for library application. [5+5]

---ooOoo---

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
VLSI DESIGN
(Common to ECE, ETM)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART – A

(25 Marks)

1.a)	What is pull up and pull down device?	[2]
b)	Why NMOS technology is preferred more than PMOS technology?	[3]
c)	What are the uses of Stick diagram?	[2]
d)	What is the fundamental goal in Device modeling?	[3]
e)	List out the sources of static and dynamic power consumption.	[2]
f)	Define Fan-in and Fan-out.	[3]
g)	Why is barrel shifter very useful in the designing of arithmetic circuits?	[2]
h)	Write the principle of any one fast multiplier.	[3]
i)	What is programmable logic array?	[2]
j)	What are feed-through cells? State their uses.	[3]

PART – B

(50 Marks)

2.a)	What is meant by latch up problem? How will you prevent.	
b)	Define threshold voltage? Drive the Vt equation for MOS transistor.	[5+5]
	OR	
3.a)	Explain with neat diagrams the various NMOS fabrication technology.	
b)	Draw and explain BiCMOS inverter circuit.	[5+5]
4.	Draw the circuit diagram, stick diagram and layout for CMOS inverter.	[10]
	OR	
5.a)	Explain about the various layout design rules.	
b)	Draw the static CMOS logic circuit for the following expression	
	i) Y= (ABCD)′	
	ii) Y= [D(A+BC)]′	[5+5]
6.a)	Explain different capacitances present in CMOS design.	
b)	Explain the concept of MOSFET as switches with suitable example.	[5+5]
	OR	
7.	Write short notes on:	
	a) Ratioed Circuits	
	b) Dynamic Circuits.	[5+5]

8.a) Explain the operation of a basic 4 bit adder.
  b) Explain the operation of booth multiplication with suitable example.   [5+5]

OR

9.a) Design a 1:16 demultiplexer using 1:8 demultiplexers.
  b) Draw the structure of a 4×4 static RAM and explain it's operation.   [5+5]

10.a) Discuss any two types of programming technology used in FPGA design.
   b) Explain ATPG fault models.   [5+5]

OR

11.a) What is programmable devices? How it differs from ROM?
   b) Explain fault models of VLSI Design.   [5+5]

---ooOoo---

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
MICROPROCESSORS AND INTERFACING DEVICES
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a) What is the function of ALE signal in minimum mode of 8086?   [2]
  b) How does 8086 MP implements the pipeline process?   [3]
  c) Which instruction of 8086 can be used for look up table manipulation?   [2]
  d) What is meant by LOCK prefix? What are uses of it?   [3]
  e) What is meant by interrupt vector table of 8086?   [2]
  f) What are the advantages of DMA controller?   [3]
  g) What is the function of SYNDET/BD signal of 8251?   [2]
  h) Compare and contrast IEEE 488 and SPI bus.   [3]
  i) What is the function of timers and counters?   [2]
  j) Write the advantage of 8051microcontroller over the 8086 microprocessor.   [3]

PART - B
(50 Marks)

2.a) Describe the register organization of 8086 family microprocessor.
  b) Explain how do you calculate effective physical address using segment address and offset.   [5+5]

OR

3. Draw and explain operation of the each block for the maximum mode of microprocessor with necessary time diagrams and explain the function of each signal which is applicable in maximum mode operation of 8086.   [10]

4.a) Explain the addressing modes for control transfer instructions.
  b) Explain the significance of jump and loop instructions of 8086.   [5+5]

OR

5. Explain the all assemblers and operators available in 8086 with suitable examples. [10]

6.a) Describe the interrupt request response of the 8086 in detailed.
  b) Describe the procedure for interfacing of Analog to digital converter with 8086 microprocessor with relevant diagrams.   [5+5]

OR

7.a) Draw and explain the internal architecture of 8259.
  b) Describe the control word format of 8255 for I/O and BSR mode.   [6+4]

8.a) Briefly explain the serial data transfer standards for interfacing of devices.
  b) Explain the operation of IEEE 488 with neat block diagrams.   [5+5]

OR

9.a) Draw and explain the synchronous mode transmitter and receiver data formats of USART 8251.
  b) Discuss briefly the concept of prototype and trouble shooting.   [5+5]

10. Draw the internal architecture of 8051 and explain the operation of each block.   [10]

OR

11.a) Describe the internal and external RAM organization of 8051 in detailed.
  b) Explain the different arithmetic instructions of 8051 in detailed.   [5+5]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
AUTOMOBILE AIR CONDITIONING
(Automobile Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) Explain various types of refrigerants. [2]
   b) State the effects of sub cooling and super heating of refrigeration. [3]
   c) Write different types of processes used in air conditioning systems. [2]
   d) Discuss the importance of evaporator in air conditioning systems. [3]
   e) Give the objectives of ventilation in air conditioning. [2]
   f) Give a brief note on Grills used in air conditioning. [3]
   g) What is meant by discharging of the air conditioning system? [2]
   h) Explain the causes of air conditioner failure. [3]
   i) What are the effects of compressor failure? [2]
   j) What are the various preliminary system inspections to be performed before performing any of the service procedures? [3]

PART - B

(50 Marks)

2. A machine working on a Carnot cycle operates between 305 K and 260 K. Determine the COP when it is operated as (a) a refrigerator (b) a heat pump (c) a heat engine.[10]

OR

3.a) Give a brief note on refrigerants used in Automobile and give their properties.
   b) Explain the importance of air conditioning in an automobile and write its requirements.
                                                                                  [5+5]

4.a) With a neat sketch explain automobile air conditioning system.
   b) Explain how air conditioning system can be protected from the engine heat in an automobile. [5+5]

OR

5.a) The amount of air supplied to air conditioned hall is 300 m^3/min. The atmospheric conditions are 35^{0}C DBT and 55% RH. The required conditions are 20^{0}C DBT and 60% RH. Determine the sensible heat and latent heat removed from the air per minute. Also find the SHF for the system.
   b) Explain the concepts of human comfort and effective temperature of air conditioning systems. [5+5]

6.a) State the different types of air conditioners and explain each of them in brief.
  b) Discuss the vehicle ventilation systems and air heating equipments in detail. [5+5]

OR

7.a) Give a brief note on following:
     i) Filters   ii) Registers and Grills
  b) Discuss on the resent advancements in automotive air conditioning design. [5+5]

8.a) Give a brief note on trouble shooting of air conditioner heater systems.
  b) Explain charging and discharging of air conditioner systems. [5+5]

OR

9.a) What are the different tools used for the diagnosis of an automotive air conditioning unit?
  b) Explain about trouble shooting of automotive air conditioning system. [5+5]

10.a) Write a note on compressor trouble shooting.
   b) What are the objectives of air conditioner maintenance? [5+5]

OR

11.a) Explain the procedure of seal removal and checking of oil level.
   b) Discuss about the trouble shooting and services for following: [5+5]
      i) Compressor   ii) Clutch

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
COMPUTER METHODS IN POWER SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.   Determine the Y_{BUS} for the system shown in below figure 1 using singular transformation method. Assume there is no mutual coupling between any of the branches. Values shown in the figure 1 are, voltages and impedances in per unit.   [15]
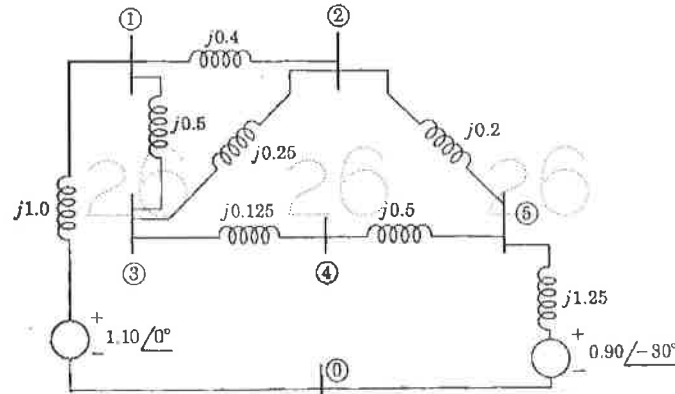
Figure 1

2.   Derive the necessary steps involved in modifying Z_{BUS} when
     a) Addition of element from a new bus to reference
     b) Addition of element from a new bus to an old bus
     c) Addition of element between two old busses.   [5+5+5]

3.a) Explain the classification of Load Flow studies.
  b) For the system shown in below figure 2, find the voltage at the receiving bus at the end of the first iteration. Load is (2+j0.8) p.u. Voltage at the sending end (slack) is (1+j0) p.u. Line admittance is (1.0-j4.0) p.u. Transformer reactance is j0.4 p.u. Off-nominal turns ratio is 1 : 1.04. Use the GS technique. Assume the initial voltage V_R = 1.0+j0.
                                                                            [7+8]
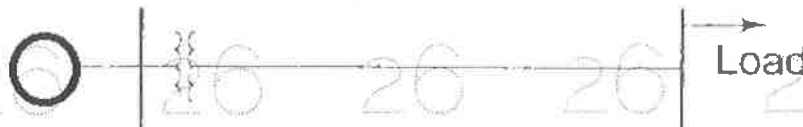

Figure 2

4.   Explain the formulation of Newton Raphson load flow method in rectangular form. Derive the equations to determine elements of Jacobian matrix in this case.   [15]

5.a) For the system shown in below figure 3 obtain the single line reactance diagram with all values transform on to a common base of 50MVA, 11.2kV.
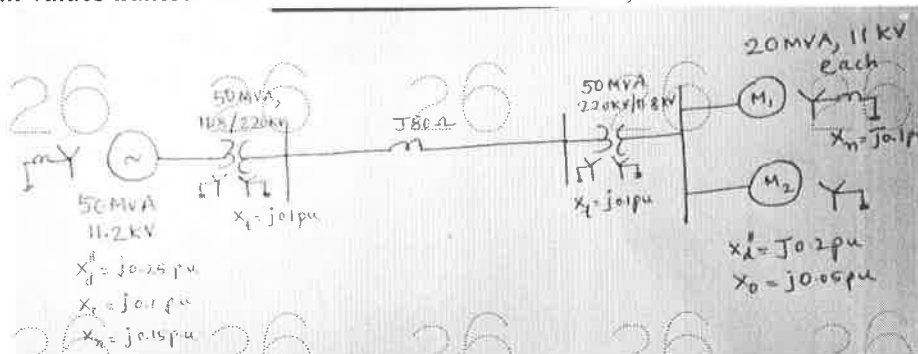

Figure 3

b) Why series reactors are used in power system? Explain. [8+7]

6.a) For the power system shown in figure 4 below, draw the positive, negative and zero sequence network. The generators and transformers are rated as follows:

Generator 1: 25MVA, 11kV, $X'' = 0.2$, $X_2=0.15$, $X_0=0.03$ pu.
Generator 2: 15MVA, 11kV, $X'' = 0.2$, $X_2=0.15$, $X_0=0.05$ pu.
Synchronous Motor 3: 25MVA, 11kV, $X'' = 0.2$, $X_2=0.2$, $X_0=0.1$ pu.
Transformer 1: 25MVA. 11/120 kV Δ/Y, X=10%.
2: 12.5MVA. 11/120 kV Δ/Y, X=10%.
3: 10MVA. 120/11 kV Y/Y, X=10%.
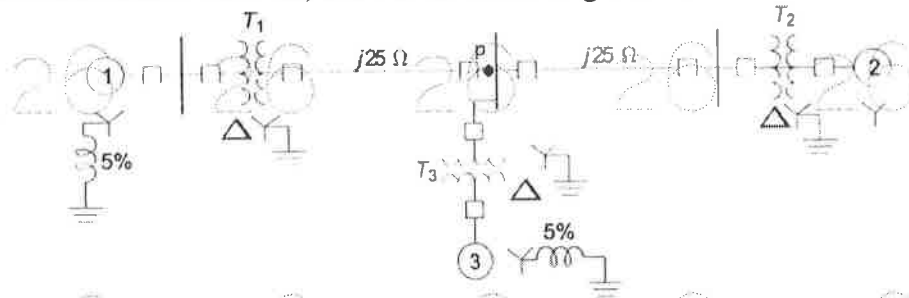Choose a base of 50MVA, 11kV in the circuit of generator 1.

Figure 4

b) In case of an LLG fault at point 'P' in the above figure 4, determine the fault current in phasor component. [8+7]

7.a) Define steady state, dynamic and transient stability of the power system.
b) Derive the power angle equation of a SMIB system and give the necessary condition for system to be steady state stable. [7+8]

8.a) A 20MVA, 50Hz generator delivers 18MW over a double circuit line to an infinite bus. The generator has kinetic energy of 2.52MJ/MVA at rated speed. The generator transient reactance is $X_d' = 0.35$ pu. Each transmission circuit has R=0 and reactance of 0.2 pu on a 20MVA base. $|E'| = 1.1$pu and infinite busvoltage V=1.0∟0^0. A three-phase short circuit occurs at the mid-point of one of the transmission lines. Determine the critical clearing angle of the system using equal area criterion.
b) Explain the methods to improve transient stability of the system. [8+7]

---ooOoo---

Code No: 56005

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
TRANSPORTATION ENGINEERING
(Civil Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks

- - -

1.a)   What are the salient features of early Roman Roads?
  b)   Explain the Nagpur plan formulae and the salient features of the plan.   [5+10]

2.a)   What are the factors controlling the alignment of roads? Explain.
  b)   Explain the engineering surveys needed for locating a new highway.   [6+9]

3.a)   What are the various geometric elements to be considered in highway design?
  b)   What is super elevation? Explain maximum and minimum super elevations?
  c)   Derive an expression for finding length of transition curve on horizontal alignment.
                                                                                   [5+5+5]

4.a)   Explain spot speed, running speed, space-mean speed, time-mean speed and average speed.
  b)   Discuss briefly the different causes of traffic accidents.
  c)   Explain briefly the various aspects investigated during parking studies.   [5+5+5]

5.a)   Explain the various types of traffic signals and their functions.
  b)   Explain how are the signal timing is decided?
  c)   What is intelligent transport system? Give an example.   [8+3+4]

6.a)   Describe briefly the different types of traffic islands.
  b)   Explain briefly the various design factors to be considered in rotary intersection.
  c)   What are the relative advantage and disadvantages of overpass and under pass?[8+3+4]

7.a)   Explain the type of gradients adopted in geometric design of a railway track.
  b)   Write short note on theories of creep.
  c)   Write short notes on Sleeper density and Cant Deficiency.   [4+5+6]

8.a)   What are the factors to be considered for selection of suitable site for an Airport.
  b)   What are the parameters to be considered for computation of a runway length?
  c)   What is the need of Wind Rose Diagram in designing runway of an airport?   [7+5+3]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
HEAT TRANSFER
(Common to AME, ME)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- - -

1.a) Explain the mechanism of convection.
 b) Water at a mean temperature of 20^0C flows over a flat plate at 80^0C. If the heat transfer coefficient is 200 W/(m^2 .^{0}C), determine the heat transfer per square meter area of the plate over 5 hours. [7+8]

2.a) What is meant by critical thickness of insulation?
 b) A steel tube with ID 5.0cm, OD 7.6cm and k= 15 W/(m^{0}C), is covered with an insulative covering of thickness 2cm of k= 0.2 W/(m^{0}C). A hot gas at T$_a$= 330^{0}C, h$_a$ =400 W/(m^2 .^{0}C), flows inside the tube. The outer surface of the insulation is exposed to cooler air at T$_b$= 30^{0}C with h$_b$ =60 W/(m^2 .^{0}C). Calculate the heat loss from the tube to the air from a length of 10m of the tube. [7+8]

3.a) Explain the concept of unsteady state with an example.
 b) An iron sphere of thermal conductivity 60 W/(m^{0}C), density 7850 kg/m^3, specific heat of 460 J/(kg. ^{0}C) and thermal diffusivity α = 1.6 $\times$ 10^{-5} m^2/s of diameter 5 cm is initially at a uniform temperature of 225^{0}C. Suddenly the surface of the sphere is exposed to an ambient at 25^{0}C with a heat transfer coefficient of 500 W/(m^2 .^{0}C). Calculate the center temperature 2 mins after the start of cooling. [7+8]

4.a) What is meant by dimensional analysis? Explain in brief.
 b) Determine the hydrodynamic entry length for flow at a bulk temperature of 60^{0}C at a rate of 0.015 kg/s of water through a circular tube of inside diameter 2.5cm. [7+8]

5.a) What are the various non dimensional terms involved in a free convection process?
 b) A large vertical plate at a uniform temperature of 100^{0}C is exposed to atmospheric air at 20^{0}C. Determine the location from the lower edge of the plate where the transition from laminar to turbulent flow takes place. [7+8]

6.a) Give equations applicable for nucleate and film boiling process.
 b) What are the assumptions made by Nusselt in the analysis of laminar film condensation from a vertical plate? [7+8]

7. A counter flow heat exchanger of area A=12.5 m^2 is to cool oil having a specific heat C$_p$= 2000 J/(kg. ^{0}C) with water of C$_p$= 4170 J/(kg. ^{0}C). The oil enters at 100^{0}C at a mass flow of 2 kg/s, while the water enters at 20^{0}C at 0.48 kg/s. The overall heat transfer coefficient of the heat exchanger is 400 W/(m^2 .^{0}C). Calculate the exit temperature of water and the total heat transfer rate, Q. [15]

8.a) Give the equation for radiation exchange between two black bodies.
 b) Explain Wien's law.
 c) What is meant by radiation shield? [5+5+5]

---ooOoo---

Code No: R9505

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year II Semester Examinations, December-2017
PHARMACEUTICAL JURISPRUDENCE

Time: 3hours   Max.Marks:75

Answer any five questions
All questions carry equal marks
- - -

1. Write the origin of pharmaceutical legislation and write its purpose and importance in India.   [15]

2. Write the functions of state pharmacy council and joint state pharmacy councils.
                                                                            [15]

3. Write the objectives and amendments of D&C act 1940.   [15]

4. What types of licences are issued under the act for manufacture of preparations containing alcohol and other narcotic substances?   [15]

5. What are the offences and penalties issued under Narcotic drugs and psychotropic substances act for misuse of drugs.   [15]

6.a) Define bulk drug, formulation, ceiling price, Dealer, Distributor, non scheduled bulk drug, Non scheduled formulation sale turn-over and whole sales.
   b) Write the equation for retail price fixation of a formulation and indicate each term.   [15]

7. Write the drugs and magic remedies rules.   [15]

8. Write briefly on the following:
    a) Factories Act 1948.
    b) WTO and GATT.   [15]

--ooOoo--

Code No: 126EA
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
INTELLECTUAL PROPERTY RIGHTS
(Common to AE, AGE, CHEM, EEE, ECE, EIE, IT, ME, MMT, MIE)
Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a)	Define Intellectual property right.	[2]
b)	What are the agencies involved in intellectual property rights?	[3]
c)	What is the purpose of a trademark?	[2]
d)	Discuss about the concept of protectable matter.	[3]
e)	Define patent.	[2]
f)	Write a short notes on transfer of ownership rights.	[3]
g)	What do you mean by a trade secret?	[2]
h)	Discuss about unfair competition.	[3]
i)	Define international intellectual property.	[2]
j)	What are the attributes of IPR audit?	[3]

PART - B
(50 Marks)

2.	List and explain in detail about various types of intellectual property rights.	[10]
	OR	
3.	With an example, outline the importance of intellectual property rights.	[10]
4.	Describe the process involved in the registration of a trademark.	[10]
	OR	
5.	Illustrate the process involved in selecting and evaluating a trademark.	[10]
6.	What are the characteristics and features of a copyright? Explain.	[10]
	OR	
7.	Illustrate in detail about the concept of patent searching process.	[10]
8.	Explain in detail about the law of a trade secret.	[10]
	OR	
9.	Describe in detail about the litigation of a trade secret.	[10]
10.	What are the new developments in patent law? Explain.	[10]
	OR	
11.	Describe in detail about the concept of international copyright law.	[10]

---ooOoo---

Code No: 126AP

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
DISTRIBUTED SYSTEMS
(Computer Science and Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	What are the different challenges of distributed system?	[2]
b)	Describe about distributed multimedia systems.	[3]
c)	Write about Distributed debugging.	[2]
d)	What are the problems that are associated with the coordination and agreement in distributed systems?	[3]
e)	What is Inter process communication?	[2]
f)	What is meant by group communication?	[3]
g)	Define Distributed File system.	[2]
h)	Write about sequential consistency.	[3]
i)	Write rules for connecting of nested transaction.	[2]
j)	Write about active and passive replications.	[3]

PART - B

(50 Marks)

2.a) Describe the distributed computing as utility.
   b) What are the different benefits of resource sharing? Explain about its significance?
                                                                                          [5+5]
OR
3.a) What are the different system model of distributed system?
   b) Discuss how distributed systems are more scalable than the centralized systems?   [5+5]

4.a) What are the features required for election algorithms.
   b) Explain how election is done when any particular system crashes?   [5+5]
OR
5.a) Write about bully algorithm and summarize how it is different from other election algorithms.
   b) What is meant by event ordering? Explain real time ordering of events.   [5+5]

6.a) What meant by marshalling? Differentiate between TCP stream communication and Client Server Communication.

b) Discuss about the communication between distributed objects in RMI. [5+5]

OR

7.a) What is meant by inter process communication? How inter process communication is used in distributed systems?

b) What are design issues for remote method invocation? [5+5]

8.a) Explain in brief about directory and discovery services.

b) Discuss the design and implementation issues of Domain Name System. [5+5]

OR

9.a) Discuss in detail about Munin.

b) List the characteristics of file systems. [5+5]

10.a) Explain with an example how two transactions are interleaved which are serially equivalent at each server but is not serially equivalent globally?

b) Explain how distributed deadlocks can be detected? [5+5]

OR

11.a) What is meant by concurrency control? How it is important in distributed systems?

b) Explain how primary-backup model of replication is fault tolerant? [5+5]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
DISASTER MANAGEMENT
(Common to AE, AGE, AME, EEE, ECE, EIE, IT, MSNT, ME, MIE, PTM)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	What are the environmental hazards?	[2]
b)	What is ecosystem?	[3]
c)	Explain about chemical hazards.	[2]
d)	Define physical and biological Hazards.	[3]
e)	What is an earthquake?	[2]
f)	What are the causes of land slide? Explain.	[3]
g)	Define soil erosion.	[2]
h)	Define heat wave floods.	[3]
i)	Define disaster management.	[2]
j)	Define pre-disaster stages.	[3]

PART - B

(50 Marks)

2.	Define Ecology? Explain with the help of diagram Ecosystem Approach.	[10]
	OR	
3.	Explain clearly the application of human ecology in geographical researches.	[10]
4.	Write a detailed note on Natural hazard briefly.	[10]
	OR	
5.	Explain briefly about the planetary disasters occurs and its management.	[10]
6.	What are the environmental impacts of volcanic eruptions? Explain.	[10]
	OR	
7.	How the mitigation and perception of earthquake is done in India? Explain.	[10]
8.	How cyclones occur? Write a short note on Tropical cyclones and local storms.	[10]
	OR	
9.	What are the factors of soil erosion? Explain in brief about conservation measures of soil erosion.	[10]
10.	Write short notes on emergency stage in disaster management.	[10]
	OR	
11.	What is meant by post disaster stage? Explain clearly.	[10]

---ooOoo---

R13

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	What is *Swatantrata*?	[2]
b)	What do you understand by the terms 'the state of happiness' and 'the state of unhappiness'?	[3]
c)	What is *'suvidha'*?	[2]
d)	What is the need of 'I'?	[3]
e)	Define the 'feeling of trust in relationship'.	[2]
f)	How would you define 'intention' and 'competence'?	[3]
g)	What is the meaning of 'gratitude'?	[2]
h)	Which are the four orders of nature?	[3]
i)	What does '*niti*' mean?	[2]
j)	What is your understanding the word 'profession'?	[3]

PART - B

(50 Marks)

2.a)	What constitutes value education? What is the need for value education?	
b)	Explain the process of value education.	[5+5]
	OR	
3.a)	What is the meaning self exploration? What is its purpose?	
b)	What is the general prevailing notion of happiness and prosperity?	[5+5]
4.a)	What is the general understanding on 'right utilization of body'?	
b)	Clarify the point that pleasure from sensation are quite short lived in nature.	[5+5]
	OR	
5.a)	What is the effect of 'realization' and 'understanding' on human conduct?	
b)	What is the need to know oneself? What are the questions to be posed to oneself in this context?	[5+5]
6.a)	What are the salient values in relationship?	
b)	What is the basis for respect to human being? Elaborate your point of view.	[5+5]
	OR	
7.a)	In the context of sustainable happiness and prosperity for all, what should be the human goal?	
b)	How do you distinguish genuine storage from hoarding? What should be the purpose of storage?	[5+5]

8. Explain the interconnectedness and mutual fulfillment of the four orders in nature. [10]

OR

9. a) Explain the process of recycle and self regulation in nature.
   b) What is the concept of units in space? How are units self organized in space? [5+5]

10. a) How would you explain the expression ' competence in professional ethics'?
    b) What should be the holistic criteria for guiding the development of technology? [5+5]

OR

11. a) What are the characteristics of holistic management model?
    b) What needs to be done to make value education increasingly relevant and pertinent?
       [5+5]

---ooOoo---

Code No: 56032

R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
WEB TECHNOLOGIES
(Common to CSE, IT)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a)   Differentiate inline style sheet and external style sheet with examples.
   b)   Write a program to display time table using table tag.   [8+7]

2.a)   What is a java script object? How to access the properties and functions of java script
         object?
   b)   List the differences between HTML and DHTML. Explain with suitable examples.
                                                                                                              [8+7]

3.a)   Explain the concept of XML trees with an example.
   b)   What is SAX? How SAX parses the XML file.   [7+8]

4.a)   Explain the advantages and disadvantages of Java Beans.
   b)   Write a brief note on tomcat web server.   [8+7]

5.a)   Give an overview of interfaces defined in java bean API.
   b)   Draw and explain the servlet life cycle.   [7+8]

6.a)   Discuss the Anatomy of a JSP Page.
   b)   List and explain the classes and interfaces in javax.servelet.* package.   [7+8]

7.a)   With the help of a neat diagram explain the sharing of data between the pages.
   b)   How to use Scripting Elements in JSP.   [10+5]

8.a)   Assume that you have a valid database of B.Tech students. Write a JSP program for the
         result portal.
   b)   Briefly describe Struts framework.   [8+7]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
AUTOMOBILE ENGINEERING
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) Explain super charging and turbo charging.
  b) Describe the working of crescent type gear pump and Rotor pump with neat sketches.
  [7+8]

2.a) How can we test the fuel feed pump? Explain in detail.
  b) With a neat sketch explain the construction and working of electronic petrol injection system. [7+8]

3.a) What are the types of engine cooling system? Explain the cooling system used in four wheelers.
  b) What is spark advance? State the different defects in spark plug. [8+7]

4.a) What are the main components in CNG conversion kit? Explain each of them in brief.
  b) Explain multipoint fuel injection system for SI engines. [8+7]

5.a) Explain the operation of the turn signal light unit.
  b) Explain solenoid switch with neat sketch. [7+8]

6.a) Explain the working principle of torque converter with a neat sketch.
  b) Write short note on following: [7+8]
     i) Hotch-Kiss drive system   ii) Differential rear axles.

7.a) What are the objectives of employing suspension on an automobile? Explain in brief.
  b) Sketch and explain the construction and working of wishbone type independent front suspension system. [7+8]

8.a) Write short note on following:
     i) Steering Gears   ii) Steering Linkages
  b) What is meant by Toe-in or Toe-out? Describe the working of a power steering unit with a neat sketch. [8+7]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
RENEWABLE ENERGY SOURCES
(Electrical and Electronics Engineering)

Time: 3 hours
Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) What is meant by terrestrial and extraterrestrial solar radiation?
 b) Explain with a sketch the working of a sun shine recorder. [7+8]

2.a) What is meant by selectivity in solar thermal collectors?
 b) Discuss the working of flat plate collector for efficient thermal energy conversion. [4+11]

3.a) Explain the VI characteristics of PV cell.
 b) Discuss the working of solar distillation with a diagram. [6+9]

4.a) Classify wind turbines and discuss their advantages over other energy resources.
 b) With sketches, explain various configurations of wind turbines. [5+10]

5.a) Describe various steps of an aerobic digestion.
 b) Explain the principle of bio conversion in Chinese or Pit type digester. [7+8]

6.a) Discuss the potential of geothermal resource in India.
 b) Explain power generation from vapour dominated systems. [6+9]

7.a) What are the applications of Ocean thermal energy conversion system?
 b) Explain the operation of waves energy conversion devices. [4+11]

8.a) What is meant by Direct Energy Conversion? Explain the advantages of direct energy conversion over thermodynamic cycles.
 b) What is the principle of energy conversion in DEC system? [8+7]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
INTELLECTUAL PROPERTY RIGHTS
(Civil Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1. Define Intellectual Property Rights. What are the different properties protected under IPR? What are the merits and demerits of IPR?   [15]

2. Define Trade Mark. What are the salient features of Trade Mark? Explain trade mark registration processes.   [15]

3. Define Copyright. What are the all constitutes Copyright? Explain notice of copy right.   [15]

4. What is a patent? Describe the term patents with reference to the
    a) Claims and types of claims
    b) Application
    c) Examiner.   [5+5+5]

5. Explain infringement, invalidation and litigations in patent act with suitable examples.   [15]

6. Explain about unfair competition and false advertising, with suitable real time examples.   [15]

7. Explain new developments in
    a) trade mark law
    b) Copy right law
    c) Patent law.   [5+5+5]

8. Explain international overview on copyright law, international patent law and trade secrets law.   [15]

---ooOoo---

Answer any five questions
All questions carry equal marks

- - -

1. Define fabrication, piling, and form work. Explain its significance in detail.   [15]

2. Explain clearly the project planning techniques.   [15]

3. Differentiate handling equipment and concrete equipment.   [15]

4. What are different types of estimations? Briefly explain.   [15]

5. Explain various factors leading to environmental safety.   [15]

6. Explain the process of bidding.   [15]

7. What are green buildings? Explain its salient features.   [15]

8. Explain resource leveling with one application in construction activity.   [15]

---ooOoo---

R09

Code No: 56086

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
PROBABILITY AND STATISTICS
(Bio-Technology)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) What is the probability that at least two out of n people have the same birthday in a non-leap year?

b) Two persons A and B toss a dice. The person who first throws 4 or 5 wins. A starts the game. Show that the probabilities of A's and B's winning are in the ratio 3:2. [7+8]

2. The diameter of an electric cable is assumed to be continuous random variable with probability density function $f(x) = 6x(1-x)$, $0 \leq x \leq 1$, Jusitfy. Find the mean and variance of the distribution. [15]

3.a) Find the probability that out of 100 patients between 84 and 95 inclusive will survive a heart-operation given that the chances of survival is 0.9.

b) On an average, 2 vehicles pass by a road per minute. Find the probability of 0, 1, 2, 3, 4, 5 vehicles per minute. [7+8]

4.a) A random sample of size 81 is taken from an infinite population having the mean 65 and standard deviation 10. What is the probability that $\bar{X}$ will lie between 66 and 68?

b) Determine the probability that the sample mean area covered by the sample of 40 of 1 liter paint boxes will be between 510 and 520 square feet, given that a 1 liter of such paint box covers on the average 513.3 square feet with standard deviation of 31.5 square feet. [7+8]

5.a) Why are interval estimates in most cases more useful than point estimates?

b) Find the degree of confidence to assert that the average salary of school teachers is between Rs.272 and Rs.302 if a random sample of 100 such teachers revealed a mean salary of Rs.287 with standard deviation of Rs.48. [7+8]

6.a) Discuss various types of alternative hypothesis with suitable example.

b) A coin was tossed 400 times and returned heads 216 times. Test the hypothesis that the coin is unbiased. Use a 0.05 level of significance. [7+8]

7.a) Write the conditions of validity of χ^2-test.

b) A die is thrown 120 times and frequencies of various faces are as follows

Face No.	1	2	3	4	5	6
Frequency	10	15	25	25	18	27

Test whether the die was fair. [7+8]

8.a) Define the terms:
   i) Expected queue length
   ii) Ideal period
   iii) Busy period
   iv) Mean service rate.
   b) Show that for a single service station, Poisson arrivals and exponential service time, the probability that exactly n calling units are in the queuing system is $P_n = (1-\rho)\rho^n$, $n \geq 0$, where ρ is the traffic intensity. [8+7]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Common to CSE, ECE, ETE, MMT)

Time: 3 hours
Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) Explain the concept of 'Demand'. [2]
 b) Define Elasticity of demand and mention the formula for measurement. [3]
 c) What are 'Isocosts'? [2]
 d) Give the Cobb Douglas production function. [3]
 e) What are the features of perfect competition? [2]
 f) Write about the different forms of business organisation. [3]
 g) Give the different types of capital. [2]
 h) What is a cash budget? [3]
 i) Write a note on IFRS. [2]
 j) What is the difference between journal and Ledger? [3]

PART - B

(50 Marks)

2.a) What do you understand by managerial economics?
 b) Give the nature and scope of managerial economics. [5+5]
OR
3.a) What are the different types of elasticity of demand.
 b) 8000-1000p=-4000+2000p, what is the value of p? [5+5]

4.a) Explain the laws of returns.
 b) Fixed Costs Rs.24000 pa, Variable Cost Per Unit is Rs.6, Selling Price Per Unit is
 Rs.10 and Quantity Produced is 10000 Units. What is break even point? [5+5]
OR
5.a) Write in detail about production function.
 b) You run a manufacturing business that is involved in manufacturing and selling a single
 product. The annual fixed expenses to run the business are Rs15,000 and variable
 expenses are Rs7.50 per unit. The sale price of your product is Rs15 per unit. What is
 the margin of safety? [5+5]

6.a) Compare and contrast monopoly and monopolistic competition.
 b) What is pricing? What are the practices of pricing methods in India? [5+5]
OR
7.a) Compare and contrast perfect competition and monopoly.
 b) Write a note on the impact of liberalisation on the business environment. [5+5]

8. ABC Ltd is a small company that is currently analyzing capital expenditure proposals for the purchase of equipment. The capital budget is limited to Rs 500,000 which ABC Ltd believes is the maximum capital it can raise. The initial investment and projected net cash flows for each project are shown below. The cost of capital of ABC Ltd is 12%. You are required to compute the NPV. Rank them in the order of acceptance. Is the capital budget fully utilized? [10]

	Project A	Project B	Project C	Project D
Initial Investment	200,000	190,000	250,000	210,000
Annual Cash Inflows				
Year 1	50,000	40,000	75,000	75,000
2	50,000	50,000	75,000	75,000
3	50,000	70,000	60,000	60,000
4	50,000	75,000	80,000	40,000
5	50,000	75,000	100,000	20,000

OR

9. The following results are expected by XYZ Ltd. by quarters next year, in thousands of rupees.

Particulars	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Sales	7500	10500	18000	10500
Production costs	7000	10000	8000	8500
Selling, administrative costs	1000	2000	2900	1600
Purchase of plant	100	1100	2100	2100

The debtors at the end of the quarter are one-third of sales of the quarter. The opening balance of debtors is Rs.3000000. Cash on hand at the beginning of the year is Rs.650000 and desired minimum balance is Rs.500000. Borrowings are made at the beginning of the quarters in which the need will occur in multiples of Rs.10000 and are repaid at the end of quarters. You are required to prepare a cash budget by quarters for the year. [10]

10. From the following Trial Balance of X Ltd. Company as at 31st March, 2017. Prepare Trading and Profit and Loss Account for the year ended 31st March 2017 and a Balance Sheet as on that date:

Debit Balances	Rs.	Credit Balances	Rs.
Stock	45,000	Share Capital	75,000
Plant and Machinery	75,000	Sales	4,20,750
Purchases	2,25,000	Sundry Creditors	15,000
Carriage Inwards	10,000	Bad Debts Provision	200
Carriage Outwards	2.500	Bills Payable	2,000
Factory Rent	1,500	P/L A/c	
Discount	1,500	Reserves and surpluses	25,000
Insurance	350		
Sundry debtors	60,000		15,000
Office Rent	3,000		

Printing and stationary	600		
Travellers Salaries	2,800		
Advertising	15,000		
Bills Receivable	12,000		
Salaries	15,000		
Wages	21,000		
Furniture	7,500		
Cash in hand	2,000		
Cash at Bank	12,500		
Goodwill	40,000		
	5,52,950		5,52,950

Adjustments:

a) Closing Stock amounted to Rs. 35,000.

b) Depreciation Machinery by 10% and Furniture by 5%.

c) Raise the Bad Debts Provision to 5% on Debtors.

d) Outstanding Factory Rent Rs. 300 and Office Rent Rs. 600.

e) Insurance Prepaid Rs. 100.

f) Transfer to general reserve Rs. 12,000.   [10]

OR

11. From the following Balance Sheet and other information, calculate the following:

(a) Debt-Equity Ratio (b) Quick Ratio (c) Trade ReceivablesTurnover Ratio

(d) Working capital (e) Gearing ratio (f) Net worth (g) Capital employed

Balance Sheet as at March 31, 2017

I. Equity and Liabilities:	
1. Shareholders' funds	
a) Share capital	10,00,000
b) Reserves and surplus	9,00,000
2. Non-current Liabilities	
Long-term borrowings	12,00,000
3. Current Liabilities	
Trade payables	5,00,000
Total	36,00,000
II. Assets	
1. Non-current Assets	
Fixed assets	
– Tangible assets	18,00,000
2. Current Assets	
a) Inventories	4,00,000
b) Trade Receivables	9,00,000
c) Cash and cash equivalents	5,00,000
Total	36,00,000

Additional Information: Revenue from Operations Rs. 18,00,000.GP rate is 20%.   [10]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
DESIGN OF MACHINE MEMBERS - II
(Common to AME, ME)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Assume suitable data, if necessary:

PART - A

(25 Marks)

1.a) What is journal bearing? List any two types of journal bearings depending upon the nature of contact. [2]

b) A journal bearing has a shaft diameter of 40 mm and a length of 40 mm. The shaft is rotating at 20 rad/sec and viscosity of lubricant is 20 MPa-s. The clearance is 0.020 mm. What is the loss of the torque due to viscosity of the lubricant? [3]

c) What is the function of gudgeon pin? [2]

d) A piston is made up of gray cast iron has piston head thickness of 20 mm. What will be thickness of piston barrel under piston rings if it has allowable tensile stress of 30 MPa if bore diameter is 50 mm and P_{max} is 15 MPa? [3]

e) What is the centrifugal effect on belts? [2]

f) What is block or bush chain, bush roller chain and silent chain? [3]

g) For full depth of involute spur gears, minimum number of teeth of pinion to avoid interference depends upon? [2]

h) A 20^0 full depth involute spur pinion of 4 mm module and 21 teeth is to transmit 15 kW at 960 rpm. Its facewidth is 25 mm. What is the tangential force transmitted? [3]

i) Define pitch diameter of a screw thread. [2]

j) A single square thread power screw to raise a load of 50 kN. A screw thread of major diameter of 34 mm and a pitch of 6 mm is used. The coefficient of friction at the thread and collar are 0.15 and 0.1. If the collar frictional diameter is 100 mm and the screw turns at a speed of 1 rev per second. Determine the combined efficiency of screw and collar. [3]

PART - B

(50 Marks)

2.a) In journal bearing distinguish between bearing characteristics number and bearing modulus.

b) A journal bearing of 75 mm long and 150 mm diameter has diametral clearance of 0.25 mm. Journal rotates at 3000 rpm. Compare the power loss and friction torque for SAE 10, SAE20 and SAE60 grade oils. Make suitable assumptions. 5 kN radial load is acting on the bearing. [2+8]

OR

3.a) Give the relative advantages and disadvantages of ball and roller bearings as compared to journal bearings.

b) Determine the type and size of ball bearing for a 75 mm shaft. The shaft speed is 325 rpm, the radial load is 9 kN, with very light shocks and the axial load is 3.5 kN. The installation is a temporary one, to serve not over 1 year with 8 hr service per day. The bearing is to be placed 0.9 m from one end of the shaft. [2+8]

4.a) Why are the big ends of connecting rod made bigger than the small end when small end is satisfactory in strength.

b) Design a overhanging crankshaft for a diesel engine having cylinder bore 80 mm and stroke 90 mm. Maximum allowable shear stress in the shaft is 90 MPa, maximum explosion pressure is 2.5 MPa. [2+8]

OR

5.a) Why piston clearance is necessary? What is its usual value?

b) Design the piston for a single acting 4 stroke engine for the given data
Cylinder bore= 125 mm, Stroke = 150 mm, Maximum gas pressure = 5 MPa, Indicated mean effective pressure 0.75 MPa, mechanical efficiency 82%, fuel consumption is 15 Kg kW of brake power per hour, HCV of fuel = 42.5×10^{-3} kJ/Kg and speed 1800 rpm. [2+8]

6.a) What are advantages of wire rope drive over belt drive.

b) Select a suitable wire rope for a wire hoist carrying a load of 80 kN to be lifted from a depth of 100 m. The speed of 10 m/s should be attained in 10 seconds. [2+8]

OR

7.a) List out the applications of chain driving.

b) Design a roller chain drive to transmit 35 kW from a gas engine running at 1175 rpm to a pump which is to run at 240 rpm. The possible center distance is 0.6 m. [2+8]

8.a) What is interference in involute gear?

b) A pair of spur gears must transmit 36 kW from a shaft running at 300 rpm to another shaft with speed reduction of 3.5:1. The center distance of the shafts is 400 mm. Determine:
i) Module and number of teeth on gears
ii) Dynamic and wear load. [2+8]

OR

9.a) Why should worm gear drive requires to be checked for heat dissipations?

b) A pair of straight bevel gears must transmit 15 kW at 1250 rpm of 18 tooth pinion. The speed reduction ratio is 3.5 : 1. Use $14\frac{1}{2}^0$ full depth involute teeth. Select the material to obtain a compact design. Determine module, pitch diameters, gear face and pitch cone angles for both gears. [2+8]

10.a) What is a power screw? List applications of power screw.

b) The power screw has 6 mm pitch and 40 mm diameter. The screw is subjected to an axial load of 6 kN. The length of nut is 12 mm. Determine
i) The bearing pressure between the threads
ii) The Shear stress on threads
iii) Compressive stress in the screw. [2+8]

OR

11.a) What is over hauling in screw jack? How to check overhaul?

b) A power screw for a jack has acme threads of proportion 36 × 30 × 6 mm. Friction coefficients of threadsis 0.1 and the collar is 0.2. Determine the weight that can be lifted through human effort of 300 N at the end of lever span of 500 mm. What is the efficiency and nut length required considering the bearing pressure as 9 MPa. Take mean collar diameter as 40 mm. [2+8]

---ooOoo---

Code No: 126AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, December - 2017

ENVIRONMENTAL STUDIES

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a)	What are natural ecosystems?	[2]
b)	What is food Web? Give example.	[3]
c)	What is meant by conservation of natural resources?	[2]
d)	What are fossil fuels?	[3]
e)	What is biodiversity?	[2]
f)	What are the main causes of the loss of biological diversity nowadays?	[3]
g)	Distinguish between "Ambient Air Quality Standards" and "Emission Standards".	[2]
h)	What are the air pollutants in automobile exhaust?	[3]
i)	Which type of project usually requires an EIA?	[2]
j)	What is essential in an EIA?	[3]

PART - B
(50 Marks)

2   Explain the concept of ecological pyramid.   [10]

OR

3   Explain the flow of energy through the various components of the ecosystem.   [10]

4   Enumerate the different water resources and their contribution.   [10]

OR

5   Discuss about the equitable use and conservation of natural resources.   [10]

6   What do you mean by consumptive use value, productive use value, social value, ethical value and option value of biodiversity?   [10]

OR

7   Mention the important site in India identified for the conservation of endemic species and list the major endemic species of India.   [10]

8   List the types of Indoor air Pollutants, their sources and associated impacts.   [10]

OR

9   Explain the importance of meteorology on atmospheric diffusion.   [10]

10   Explain the various steps in preparing of EIA report.   [10]

OR

11   Discuss objectives, merits and demerits of EIA.   [10]

---ooOoo---

R13

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)   List out the various obligatory points effecting a new highway alignment.   [2]
  b)   What are the various road network patterns followed in practice.   [3]
  c)   Briefly discuss the importance of Gradients for a highway facility.   [2]
  d)   Briefly discuss the importance of Extra widening on horizontal curves.   [3]
  e)   What is the importance of traffic volume studies and how the data is presented.   [2]
  f)   With the help of a neat sketch, describe condition diagram and collision diagram
       pertaining to accident studies.   [3]
  g)   What are the types of grade separated intersections and describe the traffic movement
       with a suitable sketch of one of them.   [2]
  h)   Describe the advantages and disadvantages of a rotary.   [3]
  i)   List out various types of joints in rigid pavement.   [2]
  j)   Discuss the lab tests conducted to understand the characteristics of aggregates.   [3]

PART - B

(50 Marks)

2.a)   What are the recommendations of Jayakar Committee for the systematic and scientific
       Highway Development in India.
  b)   Explain the salient features of Bombay Road Development Plan and Lucknow Road
       Development Plan.   [5+5]

OR

3.   How do you prepare Detailed Project Report for a Highway? Explain the role of
       Engineering surveys in the highway alignment and planning.   [10]

4.a)   Explain the need for Transition Curves in the design of a horizontal curve.
  b)   Calculate the rate of superelevation to be provided at a horizontal curve of radius 400m
       on a plain terrain for a design speed of 100 kmph. Is there a need for restricting the
       super elevation? If so, what is the restricted super elevation rate and find out whether
       there is a need to restrict the speed or not.   [5+5]

OR

5.a)   Calculate the OSD required on a National Highway with a design speed of 100kmph.
       Consider the rate of acceleration as 1.75kmph/sec and assume any other data required
       suitably.
  b)   Derive the expression for calculating the overtaking sight distance for a two-lane
       undivided highway with a suitable sketch.   [5+5]

6.a) What are the different causes of traffic accidents? Explain various measures that may be taken to prevent accidents.

b) What are the road user characteristics that influence the traffic on roads? Explain. [5+5]

OR

7.a) Define the three basic parameters of traffic namely volume, speed and density. Explain their interrelationship through neat diagrams.

b) What are the various types of traffic studies generally carried out to understand the traffic movement on roads? Briefly discuss. [5+5]

8.a) Explain the advantages and limitations of a Rotary intersection.

b) What are the advantages of signalized intersections? [5+5]

OR

9.a) What are the objectives of providing channelized intersections?

b) What are the advantages and disadvantages of clover leaf interchange? [5+5]

10.a) What are the objectives of joints in cement concrete pavement? Sketch the different types of joints used in pavement construction. Indicate the principle of design.

b) Discuss the IRC recommendations for highway drainage. [5+5]

OR

11.a) Explain about the components of a pavement structure and their functions.

b) Differentiate between Prime Coat, Seal Coat and Tack Coat with neat sketches. [5+5]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
ELECTRICAL MEASUREMENTS
(Electrical and Electronics Engineering)
Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks

1.a) Derive the torque equation of a moving iron instrument and further comment up on the nature of scale.
  b) The primary winding of a 1200/6A, 50 Hz current transformer has a single turn. Its secondary burden consists of a non – inductor impedance of 1.6 Ω. If the iron loss in the core is 1.6 W at full load and magnetizing mmf is 80 AT, calculate the i) flux in the core, ii) Ratio error at full load. Neglect leakage reactance.   [8+7]

2.a) Explain the working of Induction type single phase Energy meter with a neat diagram.
  b) A 50 A, 230V meter on full load test makes 61 revolutions in 37 seconds. If the normal disc speed is 520 revolutions per KWH, find the percentage error.   [10+5]

3.a) Explain the working of Crompton Potentiometer with a neat diagram.
  b) Explain the standardization procedure for the AC Potentiometer. Explain how AC Potentiometer can be used for the measurement of self inductance of a coil.   [8+7]

4.a) Explain the procedure of measuring a low resistance with the help of Kelvin's double bridge. Derive the necessary relation for finding the unknown resistance under balanced condition of the bridge.
  b) Explain the construction and working principle of Maxwell's bridge.   [8+7]

5.a) Explain the AC Potentiometer method for measurement of iron losses in ferromagnetic materials.
  b) Give the merits and demerits of ring and bar specimens that are commonly used in magnetic testing of materials   [9+6]

6.a) What is the principle of using loss of charge technique for measurement of high resistance? Derive necessary relation.
  b) In an Anderson bridge for measurement of inductance Lx and resistance Rx in the arm AB, the arms CD and DA have resistance of 600 Ω each and the arm CE has a capacitor of 1 µF capacitance. With ac supply at 100 Hz supplied across A and C balance is obtained with a resistance of 400 Ω in arm DE and 800 Ω in the arm BC. Calculate the value of Lx and Rx   [7+8]

7.a) Describe how an unknown capacitance can be measured with the help of D'Sauty's bridge. What are the limitations of this bridge and how are they overcome by using modified D'Sauty's bridge?
  b) The insulation resistance of 2 metre cable was measured by the loss of charge method. The voltage across the standard capacitor of 0.003 µF falls from 222 V to 155 V in one minute. Calculate the insulation resistance of the cable. Derive the formula used.   [8+7]

8.a) Prove that in a ballistic galvanometer, the charge is proportional to first swing of the moving coil.

b) The coil of a ballistic galvanometer has 115 turns of mean area 25×40 mm^2. The flux density in the air gap is 0.12 Wb/m^2 and the moment of inertia is $0.5\times10-6$ kg-m^2. The stiffness constant of spring is 45×10^{-6} Nm/rad. What current must be passed to give a deflection of 1000 and what resistance must be added in series with the movement to give critical damping. [8+7]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
DESIGN OF STEEL STRUCTURES
(Civil Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

IS 800 is required, Steel Tables:

1.a) Explain the philosophy of limit state design for strength and serviceability.
 b) How plastic method of design is different from limit state method of design?
 c) What is the importance of local buckling of plate elements of rolled steel sections? How is this accounted for in the design of steel members?   [5+5+5]

2.a) What are various modes of failure of a riveted joint?
 b) In a truss, ISA 80×80×8 mm is subjected to the factored tension of 175 kN. It is to be connected to a gusset plate using fillet welds at the toe and back. Design welded connection using 6 mm fillet weld. Consider field fabrication with Fe410 steel. [5+10]

3.a) Design a tension member to transmit a pull of 150kN. Effective length of member is 4.5 meters. Member should consist of a pair of angles connected to both sides of gusset plate.
 b) What is a Lug angle? Illustrate with sketch. Why lug angles are used?   [8+7]

4. Design a column with effective length 7m. It is subjected to an axial load of 1500 kN. Provide two channel sections placed back to back with lacing. Design suitable lacing system also.   [15]

5.a) Design a laterally supported beam for an effective strength of 5m to carry and U.D.L of 50 kN/m for its entire span. Check for shear and deflection
 b) Explain plastic moment carrying capacity of a section   [10+5]

6.a) Draw detailed sketch of beam to column stiffened seated welded connection(two views).
 b) An ISMB500 beam transmits an end reaction of 250 kN to the web of a column ISHB300@577 N/m. Design and sketch a stiffened seated connection. Use M24 black bolts.   [5+10]

7.a) What are stiffeners and why are they used? How many types of stiffeners are being used in the design of plate girder? Give the conditions (as per IS 800) when stiffeners are required.
 b) Write the steps involved in the design of plate girder.   [7+8]

8.a) Give, in detail, various loads considered for the design of Roof Trusses.
 b) Design angle purlin for a roof truss spaced at 4 m c/c. Angle purlins are placed 1.6 m c/c. Consider factored load on the purlin 3 kN.   [5+10]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
INDUSTRIAL MANAGEMENT
(Common to ME, MIE)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) Explain the need and importance of motivation.
 b) Explain the Maslow's need hierarchy theory. [7+8]

2.a) Explain the strengths and weaknesses of departmentation by function.
 b) Explain the features of line and staff organization. What are its advantages and disadvantages. [7+8]

3.a) Explain salient features of product layout. Discuss its advantages and disadvantages.
 b) Explain various steps involved in method study with suitable examples. [7+8]

4. Alpha industry estimates that it will sell 12000 units of its product for the forthcoming year. The ordering cost is Rs. 100 per order and the carrying cost per unit per year is 20% of the purchase price per unit. The purchase price per unit is Rs.50. Derive expression for EOQ and use.
 Find
 a) Economic Order quantity
 b) No. Of orders per year
 c) Time between successive orders. [5+5+5]

5.a) List out various methods of job evaluation. Explain any two of them in detail.
 b) Explain the term 'Transfer'. Under what circumstances transfers can increase the job satisfaction. [7+8]

6. From the activity details given below, determine the optimal project duration by taking indirect cost as Rs.70/day. [15]

| Activity | Normal | | Crash | |
	Time	Cost	Time	Cost
1-2	8	100	6	200
1-3	4	150	2	350
2-4	2	50	1	90
2-5	10	100	5	400
3-4	5	100	1	200
4-5	3	80	1	100

7.a) List out various elements of corporate planning. Explain in detail about any two elements.
 b) Explain various steps involved in strategy formulation and implementation. [8+7]

8.a) Explain about steps involved in value chain analysis.
 b) What is bench marking? State its merits and demerits. [7+8]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
STRUCTRUAL ANALYSIS - II
(Common to CEE, CE)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)   Derive the shear equation of the frame supported and loaded as shown in Figure 1.[2]
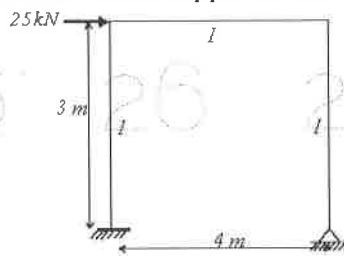
Figure 1

b)   Determine the rotation of the joint of a frame shown in Figure 2 due to the action of a
moment 'M' acting at the joint. Assume the flexural rigidity is constant.   [3]
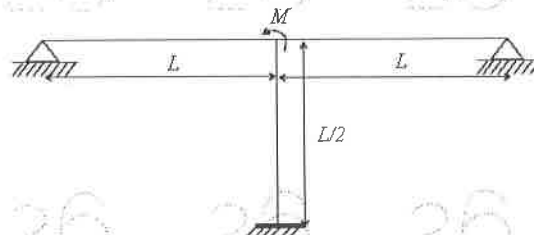
Figure 2

c)   A two-hinged circular arch of span 30 m and central rise of 5 m is subjected to a
concentrated load at a distance of 10 m from the left support. Determine the radius of
the arch.   [2]

d)   Derive the slope-deflection equation at the fixed support of the column of a frame
shown in Figure 3. Assume the flexural rigidity is constant.   [3]
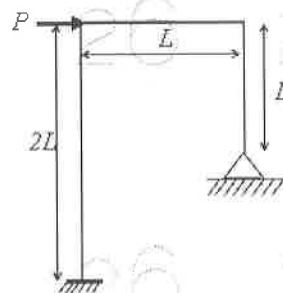
Figure 3

e) State the assumptions made in the analysis of frames by Cantilever method. [2]
f) Why it is necessary to go for appointment methods in analyzing a building frame. [3]
g) Distinguish between the Static and Kinematic Indeterminacy. [2]
h) Why the diagonal elements of the stiffness matrix are non-zero and non-negative elements. [3]
i) Draw the influence line diagram for the reaction at the prop of a propped cantilever beam of span 'L'. [2]
j) Determine the static and kinematic indeterminacy of the plane truss shown in Figure 4. [3]
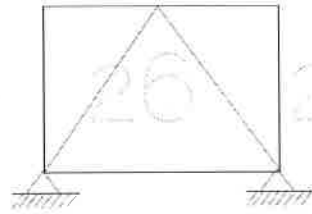
Figure 4

PART - B

(50 Marks)

2. Using moment distribution method, analyse the frame supported and loaded as shown in Figure 5. [10]
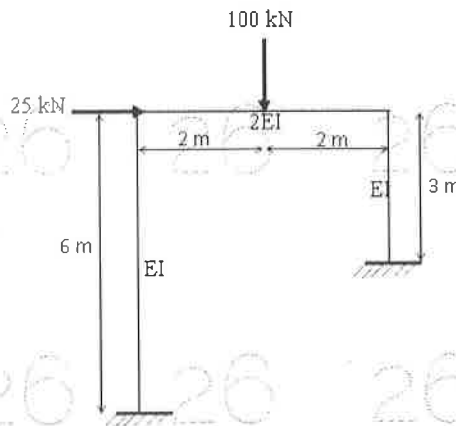
Figure 5

OR

3. Draw the shear force and bending moment diagrams of the continuous beam supported and loaded as shown in Figure 6, if the support 'C' sinks by 10 mm. Use Kani's method. [10]
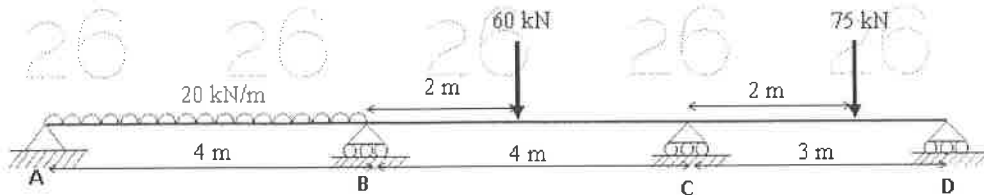
Figure 6

4. Analyse the frame shown in Figure 7, by Slope-deflection Method. Also draw the bending moment diagram. [10]
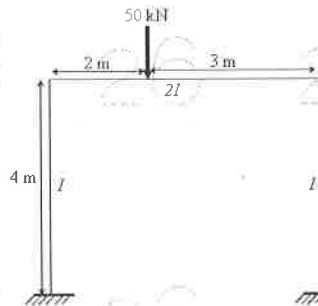

50 kN

2 m   3 m

2I

4 m   I

I

Figure 7

OR

5. A two-hinged parabolic arch of span 32 m has central rise of 8 m and the moment of inertia of the cross-section of the arch varies as the secant of the slope of the arch axis. The arch is subjected to a concentrated load of 60 kN at a distance of 12 m from the right support. Find the support reactions and the maximum bending moments in the arch. [10]

6. Analyse the frame shown in Figure 8, using Portal method and draw the bending moment diagram. [10]

3 m

75 kN

3 m

50 kN

4 m

25 kN

4 m   6 m   5 m
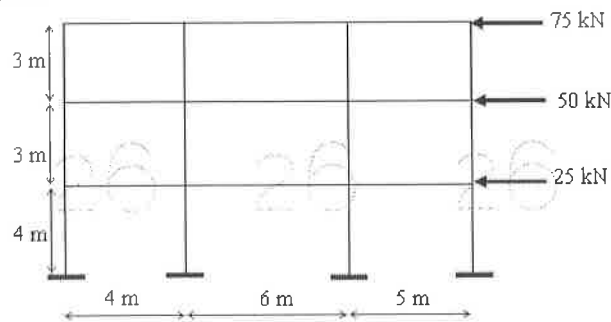
Figure 8

OR

7. Analyse the frame shown in Figure 9, using Factor method and draw the bending moment diagram. [10]

I   I   25 kN

3 m   I   2I   I

I   I   50 kN

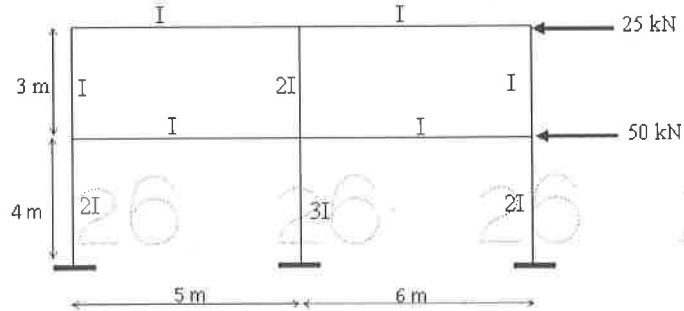4 m   2I   3I   2I

5 m   6 m

Figure 9

8. Analyse the pin-jointed plane frame supported and loaded as shown in Figure 10, using the stiffness method. [10]
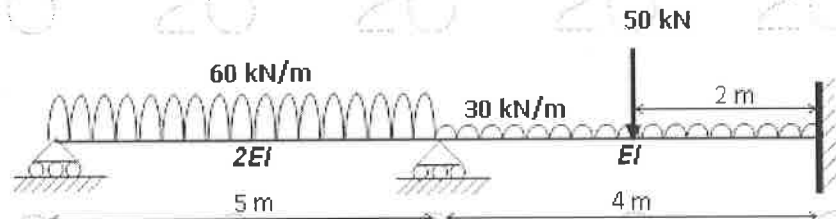

Figure 10

OR

9. Analyse the beam shown in Figure 11, using flexibility method and draw the bending moment and shear force diagrams. [10]
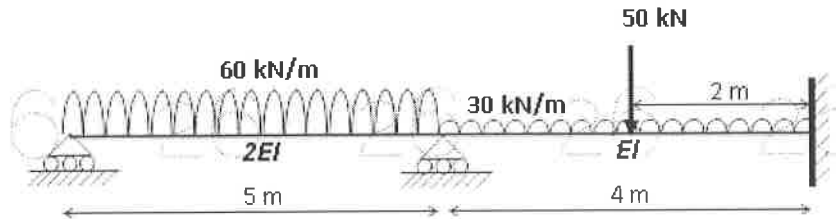

Figure 11

10. Draw the influence line diagrams for the shear force and bending moment at a section 3 m from the hinged support of a two-span continuous beam shown in Figure 12. [10]
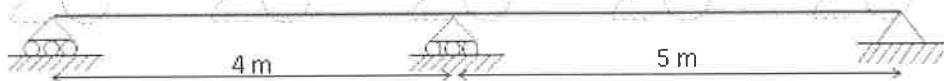

Figure 12

OR

11. Analyse the plane truss supported and loaded as shown in Figure 13. Assume the cross-sectional area of the members is the same. [10]
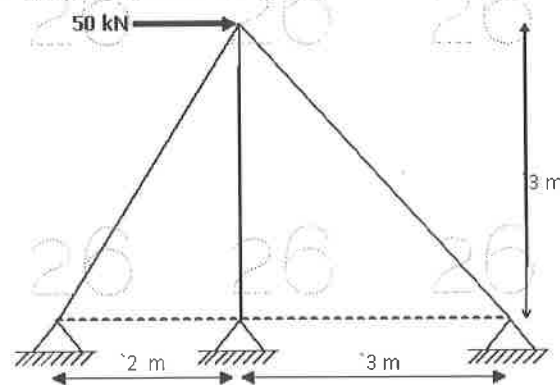

Figure 13

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
DIGITAL COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) Define Nyquist sampling theorem.   [2]
  b) Compare DM and PCM.   [3]
  c) What is the difference between coherence detection and non coherent detection? [2]
  d) Write an expression for bandwidth of binary PCM with N messages each with a maximum frequency of f_mHz.   [3]
  e) Define the principle of adaptive equalization.   [2]
  f) Construct NRZ and RZ format for 011010.   [3]
  g) What is hamming distance?   [2]
  h) What is difference between block codes and convolutional codes?   [3]
  i) Define frequency hopping.   [2]
  j) What are the types of FH spread spectrum technique?   [3]

PART - B

(50 Marks)

2. The signal $g(t) = 10 \cos(20\pi t) \cos(200\pi t)$ is sampled at the rate of 250 samples per second.
    a) Determine the spectrum of the resulting sampled signal.
    b) Specify the cut-off frequency of the ideal reconstruction filter so as to recover g(t) from its sampled version.
    c) What is the Nyquist rate for g(t).
    d) Explain the reconstruction process of a message from its samples.   [10]

OR

3. Explain the noises in delta modulation systems. How to overcome this effect in Delta modulation?   [10]

4. Explain the generation and detection of binary PSK. Also derive the probability of error for PSK.   [10]

OR

5. Draw the block diagram of FSK receiver and explain the operation. Determine the
    a) Peak frequency deviation
    b) Minimum bandwidth
    c) Baud for FSK signal with a mark frequency of 49 kHZ, space frequency of 51 kHz and input bit rate of 2kbps.   [10]

6. The generator polynomial of a (7, 4) Hamming code is defined by $g(D) = 1 + D^2 + D^3$ Develop the encoder and syndrome calculator for this code. [10]

OR

7. Explain correlation receiver with block diagram. Also explain why the correlation receiver is also called an integrated and dump filter. [10]

8. Explain Viterbi algorithm to decode a convolutionally coded message. [10]

OR

9. Describe the steps involved in the generation of linear block codes. Define and explain properties of syndrome. [10]

10. Write about the Aloha and slotted aloha methods in multiple access methods. [10]

OR

11. Describe the operation of a CDMA multiplexing system. [10]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
MATHEMATICS-II
(Automobile Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)   Find $\nabla(x - yz^2 + z)$ [2]

b)   If $\bar{F} = x^2 i - xyj$ and c is the straight line joining the points $(0,0)$ and $(1,1)$ then find
     $\int_c \bar{F} \cdot d\bar{r}$
                                                                                                           [3]

c)   If $f(x) = \begin{cases} x, & 0 \le x \le \pi \\ 2\pi - x, & \pi \le x \le 2\pi \end{cases}$ find a_0.   [2]

d)   State and prove the change of scale property of Fourier transforms.   [3]

e)   Prove that $\Delta \nabla = \delta^2$ [2]

f)   If $x, = 0, 3$, $y = 2, 17$ then find y(5) by Lagrange's interpolation formula   [3]

g)   Find any two values between which the root of $x + x \log_{10} x - 1.2 = 0$ lies   [2]

h)   Establish the formula to find the square root of a number N by Newton Raphson
     method.   [3]

i)   If $\frac{dy}{dx} = x + y$, y(0) = 2 then find y(0.1) and y(0.2) by Euler's method   [2]

j)   If $y'' + y = 2$, then find the recurrence relation connecting y_i, y_{i-1}, y_{i+1} [3]

PART - B

(50 Marks)

2.a) $\bar{F}$ = grad $(x^3 + y^3 + z^3 - 3xyz)$ Find curl $\bar{F}$.

b)   Show that curl $\left(r^n \bar{r} \right) = \bar{0}$.   [5+5]

OR

3.   Verify Green's theorem for $\int_c (xy + y^2) dx + x^2 dy$ where c is bounded by
     $y = x$ and $y = x^2$.   [10]

4.a) Find the Fourier series of the periodic function defined as

$$f(x) = \begin{cases} -\pi & in -\pi < x < 0 \\ x & in \ 0 < x < \pi \end{cases}$$

Hence deudce that $\dfrac{1}{1^2} + \dfrac{1}{3^2} + \dfrac{1}{5^2} + ... = \dfrac{\pi^2}{8}$

b) Find f(x) if its sine transform is e^{-as}. [5+5]

OR

5.a) Find the half range cosine series $f(x) = x(2-x)$ in $0 \le x \le 2$

b) Find the finite fourier cosine tranform of $f(x) = \begin{cases} x & if \ 0 < x < \dfrac{\pi}{2} \\ \pi - x & if \ \dfrac{\pi}{2} < x < \pi \end{cases}$ [5+5]

6.a) Find y(3.4) from the following table using Newton's forward interpolation formula

x	3	4	5	6
y	31	69	131	223

b) Fit the curve of the form y = a + bx [5+5]

x	1	2	3	4	5	6	7	8	9
y	9	8	10	12	11	13	14	16	15

OR

7. Fit a parabola of the form $y = a + bx + cx^2$ [10]

x	2	4	6	8	10
y	3.7880	17.2460	41.4640	76.4420	122.1800

8. Solve the system of equations using Gauss Seidal method [10]
8x - 3y + 2z = 20
6x + 3y + 12z = 35
4x + 11y - z = 33

OR

9.a) Interpret Regula Falsi method Geometrically.

b) Find a real root of $x \log_{10} x - 1.2 = 0$ correct to four decimal places using Regula falsi method. [5+5]

10. Find y(0.1) using Taylor's series method given that $\dfrac{dy}{dx} = 1 + xy$ and y(0)=1. [10]

OR

11. Find the values of y(0.25), y(0.5) and y(0.75) by finite difference method, given that $y'' - 4y = 8$, y(0) = 0, y(1) = 0. [10]

---ooOoo---

R13

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) State the significance of shape functions.   [2]
  b) Define plain strain and plane stress condition and write the D matrix for both the cases.
                                                                                              [3]
  c) Write the stiffness matrix for 2-noded beam element.   [2]
  d) What are the factors to be considered for selection of nodes?   [3]
  e) Specify the strain displacement matrix of CST element and comment on it.   [2]
  f) Describe the strain displacement matrix for 3-noded triangular element.   [3]
  g) Write the finite element equation used to analyze a two dimensional heat transfer problem.
                                                                                              [2]
  h) How do you define two dimensional elements?   [3]
  i) What are the ways by which a 3D problem can be reduced to a 2D problem?   [2]
  j) What is the difference between static and dynamic analysis with suitable examples?
                                                                                              [3]

PART - B

(50 Marks)

2.a) The following stresses are developed in a plate under plane stress $\sigma_{xx} = 12Mpa$, $\sigma_{yy} = -14Mpa$ and $\sigma_{xy} = 5Mpa$. Determine the strains induced in the plate, assuming that E = 209 GPa and ν =0.3
  b) Derive F=kU from the minimum potential energy principle for 2-noded linear element.
                                                                                             [5+5]

OR

3. A tapered bar of aluminum is having length of 520 cm. The area of cross section at the fixed end is 82 cm^2 and the free end is 20 cm^2 with the variation of the sectional area is linear. The bar is subjected to an axial load of 10 kN at 240 mm from the fixed end. Calculate the maximum displacement and stress developed in the bar?   [10]

4. For the pin-jointed truss structure as shown in figure 1 below, determine global stiffness matrix, nodal displacements and element stresses. [10]
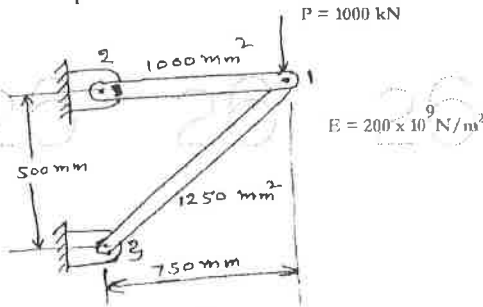
P = 1000 kN

Figure 1

OR

5.a) Write about different boundary considerations in beams in detail.

b) What is a constant strain triangular element? State its properties and applications in detail. [5+5]

6.a) The nodal coordinates of the triangular element as shown in figure 2. At the interior point 'P' the x-coordinate is 3.3 and $N_1=0.3$. Determine N_2, N_3 and the y-coordinate at point P.
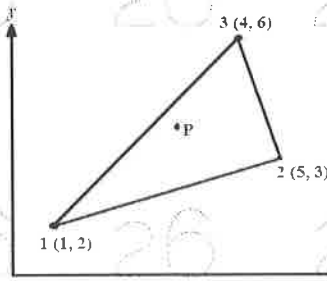
Figure 2

b) Bring out the differences between a beam element and bar element. [5+5]

OR

7.a) For point p located inside the triangle as shown in figure 3. the shape functions N_1 and N_2 are 0.15 and 0.25 respectively. Determine the x-and y-coordiante of point P.
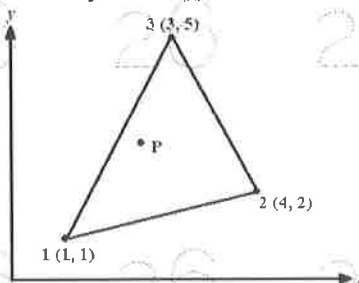
Figure 3

b) Derive the elemental stiffness matrix for a two noded beam element. [5+5]

8. A composite slab consists of 3 materials of different conductivities i.e. 22 W/m K, 32 W/m K, 52 W/m K of thickness 0.31 m, 0.14 m and 0.14 m, respectively. The outer surface is 22^0 C and the inner surface is exposed to the convective heat transfer coefficient of 28 W/m^2 K, 800^0 C. Determine the temperature distribution within the wall. [10]

OR

9.a) Discuss in detail about 2D heat conduction in Composite slabs using FEA.

b) Determine the temperature distribution along a circular fin of length 5 cm and radius 1 cm. The fin is attached to boiler whose wall temperature 140^0C and the free end is open to the atmosphere. Assume $T_a = 40^0C$, h = 10 W/cm^2 /^{0} C, k = 70 W/cm ^{0}C. [5+5]

10. How to evaluate the Eigen values and Eigen vectors? Explain the properties of Eigen Values. [10]

OR

11. Explain the importance of element mass matrix in FEM with suitable example. [10]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
COMPUTER METHODS IN POWER SYSTEMS
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A
(25 Marks)

1.a) Define the terms tree and co-tree with suitable examples.   [2]
  b) Explain demerits of Z-bus over Y-bus.   [3]
  c) What is the effect of acceleration factor in the load flow solution algorithm? [2]
  d) What is the necessity of conducting power flow studies?   [3]
  e) What are the assumptions made in short circuit studies of a large power system network?   [2]
  f) What are the applications of series reactors?   [3]
  g) How can the steady state stability of power system be increased?   [2]
  h) Distinguish between steady state and dynamic stability of a power system.   [3]
  i) Write the state variable formulation of swing equation.   [2]
  j) What is the significance of Critical Clearing Angle?   [3]

PART - B
(50 Marks)

2.a) Derive the expression for bus admittance matrix in terms of primitive admittance matrix and bus incidence matrix.
  b) For the power system network shown in Figure 1, use ground as a reference bus. Form Y_{BUS} by direct inspection method. Line and generator reactances are mentioned in the figure 1.   [5+5]
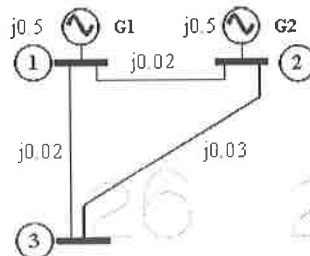

Figure 1
OR
3. Assume the bus impedance matrix for a partial network is known. Now explain the Z bus building algorithm for the following modifications. (a) Addition of a branch and (b) Addition of a link.   [10]

4.a) What are the advantages of NR-method over GS-method? Explain.

b) For the system shown in below figure 2. $P_2 = 0.5$ p.u., $Q_2 = -0.2$ p.u., $P_3 = -1$ p.u., $Q_3 = 0.5$ p.u., $P_4 = 0.3$ p.u., $Q_4 = -0.1$ p.u., and $V_1 = 1.04\angle 0^0$ p.u. Determine the value of V_2 after the first iteration of Gauss Seidel (GS) method. Line admittances are as shown in the figure 2. [5+5]
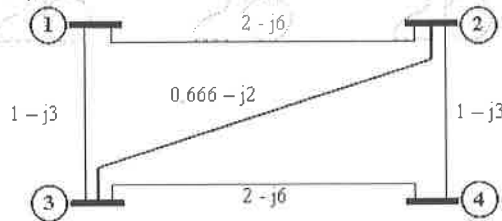

Figure 2

OR

5.a) What are the assumptions made in reducing Decoupled method to Fast Decoupled method of power flow solution?

b) The magnitude of voltage at bus-1 is adjusted to 1.05 p.u, voltage magnitude at bus-3 is fixed at 1.04 p.u with a real power generation of 2.0 p.u. A load consisting of $Pd_2 = 4.0$ p.u and $Qd_2 = 2.5$ p.u. is taken from bus-2. Given line admittances $y_{12} = (10 - j20)$ p.u., $y_{13} = (10 - j30)$ p.u., $y_{23} = (16 - j32)$ p.u. Obtain the power flow solution using FDLF method. [5+5]

6.a) The voltages across a 3-phase unbalanced load are $V_a = 300$ Volts, $V_b = 300\angle -90^0$ Volts and $V_c = 800\angle -143^0$ Volts respectively. Determine the sequence components of voltages. Phase sequence is ABC.

b) Draw the pu impedance diagram for the system shown in figure 3. Choose Base MVA as 100MVA and Base kV as 20kV. [5+5]
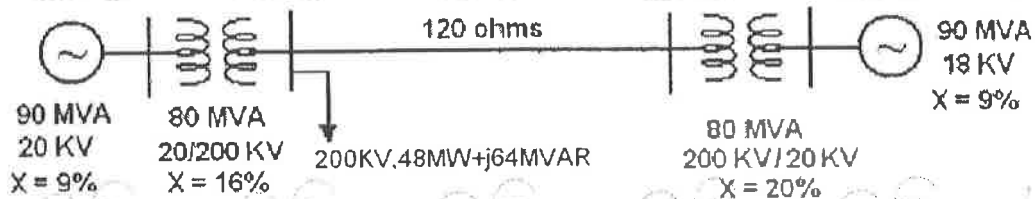

Figure 3

OR

7.a) Derive an expression for the fault current for a line-to-line fault at an unloaded generator.

b) A 20MVA, 11KV, 3-Φ, 50HZ generator has its neutral earthed through a 5% reactor. It is in parallel with another identical generator having isolated neutral. Each generator has a positive sequence reactance of 20%, Negative sequence reactance of 10% and zero sequence reactance of 15%. If a line to ground short circuit occurs in the common bus-bar, determine the fault current. [5+5]

8. Write short notes on:
    a) Selection of circuit breakers.
    b) Synchronizing coefficient and
    c) Transfer reactance.   [10]

OR

9. A 50Hz, 4 pole generator rated 100MVA, 11kV has an inertia constant of 8MJ/MVA
    a) Find the stored energy in the rotor at synchronous speed
    b) If the mechanical input is suddenly raised to 80MW for electrical load of 50MW find rotor acceleration.
    c) i) if the acceleration calculated in ii) is maintained for 10cycles, find the change in torque angle and rotor speed in rpm at the end of this speed.
    d) Another generator 200MVA, 3000rpm having H=6MJ/MVA is put in parallel with the above generator. Find the inertia constant for equivalent generator on a basis of 100MVA.   [10]

10.a) Explain clearly the application of equal area criterion for studying the transient stability of a system.
    b) Why transient state stability limit is less than steady state stability limit? Explain. [5+5]

OR
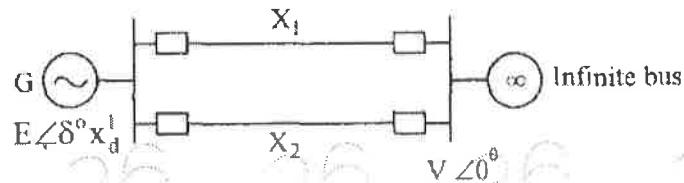
11. Consider the system shown in Figure 4 below.

Figure 4

$x_d^1 = 0.25$ p.u

$|E| = 1.25$ p.u and $|V| = 1.0$ p.u ; $X_1 = X_2 = 0.4$ p.u

Initially the system is operating stable while delivering a load of 1.25 p.u. Determine the stability of the system when one of the lines is switched off due to a fault. Also determine the maximum value of the rotor swing.   [10]

---ooOoo---

Code No: 126EP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
WEB TECHNOLOGIES
(Common to CSE, IT)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	How can you find the number of rows in a table using MySQL?	[2]
b)	What are the rules of PHP syntax?	[3]
c)	Define XML Schema.	[2]
d)	What are the elements and attributes in XML?	[3]
e)	How cookies are created?	[2]
f)	Explain about common gateway interface.	[3]
g)	What is Bean? Explain.	[2]
h)	List the scripting components of JSP.	[3]
i)	What is DATE object in Java script?	[2]
j)	How does one access cookie in a java script?	[3]

PART - B

(50 Marks)

2.a) What are the pitfalls commonly seen with the practice of inserting HTML inside PHP?
 b) Explain how PHP fits with MySQL.   [5+5]

OR

3.a) Write a PHP code to open and read contents from a given file in designated directory.
 b) Is it possible to set a time expire page in PHP? Explain how.   [5+5]

4.a) When constructing an XML DTD, how do you create an external entity reference in an attributed value?
 b) What are the common tags of XHTML? Discuss.   [5+5]

OR

5.a) Explain about various types of XML parsers.
 b) Discuss about XML flow control tags and transformation tags.   [5+5]

6.a) Describe the servlet architecture and the interfaces invoked by the servlet container.
 b) What is session management? Explain about session management in servlets.   [5+5]

OR

7.a) Explain with suitable examples, the differences between get request and post request type in Servlets.
 b) Explain how to connect to a database using JDBC. Illustrate with example.   [5+5]

8.a) Discuss various implicit objects in JSP.
 b) Write a JSP program to validate user name and password. [5+5]

OR

9.a) What are the features of Java Server Pages technology? Explain.
 b) Write a JSP to demonstrate the usage of page and include directives. [5+5]

10.a) Explain the control structures used in java script with suitable examples.
 b) Discuss the keyboard events in java script with examples. [5+5]

OR

11.a) Explain how to write functions in java script.
 b) Write a java script for sorting the elements of an array using function. [5+5]

---ooOoo---

Code No: 56027

R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
DIGITAL SIGNAL PROCESSING
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) Determine whether the following system is time invariant or not
   i) $Y(n) = nx(n)$ (ii) $y(n) = x(2n)$
 b) Draw the block diagram of digital signal processing and explain.   [8+7]

2.a) How are periodic sequences represented using Discrete Fourier series.
 b) Write about the properties of Discrete Fourier series.   [8+7]

3.a) Explain about the Radix-2 decimation-in-time algorithm.
 b) Find the IDFT of $Y(k) = \{1,0,1,0\}$.   [8+7]

4.a) Give an overview of Frequency response of stable systems.
 b) Write the design steps of Realization of digital filters using cascade form. [8+7]

5.a) Write about the frequency transformation in IIR filter.
 b) Explain about polyphase IIR filter structures for Decimators.   [8+7]

6.a) What is Recursive Filter? Explain the stability of FIR filter.
 b) Distinguish between FIR and IIR filters.   [8+7]

7.a) Explain about the concepts of upsampling and down sampling.
 b) Write about the sampling rate conversion.   [8+7]

8.a) Give an overview on Limit cycles and their implications.
 b) Explain about the Round-off noise in IIR digital filters.   [8+7]

---ooOoo---

Code No: 56029

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
VLSI DESIGN
(Computer Science and Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a)   Explain the different steps involved in n-well CMOS fabrication process with neat diagrams.
  b)   Describe the noise margins of a CMOS inverter.   [10+5]

2.a)   Determine the pull up to pull down ratio for PMOS inverters driven through one or more pass transistors.
  b)   Write the operating principle of CMOS inverter with neat block diagram.   [7+8]

3.a)   Discuss about 2 µm CMOS design rules for polysilicon and diffusion layers.
  b)   Draw the VLSI design flow diagram and explain each step.   [8+7]

4.a)   Explain the fan-in and fan-out characteristics of CMOS gates with suitable diagrams.
  b)   Write short notes for the following:
       i) Time delays   ii) Driving large capacitance load.   [7+8]

5.a)   Draw and explain the operation of ripple carry adder.
  b)   Draw the block diagram of 4bit comparator and explain operation.   [7+8]

6.a)   Explain in detail about static and Dynamic memory.
  b)   What are the different memory architecture and explain them.   [8+7]

7.a)   Explain the NMOS NAND –NAND PLA realization with a neat stick diagram.
  b)   Write a brief note on PLA based finite state machine.   [7+8]

8.a)   Explain self-test techniques and IDDQ testing.
  b)   Explain need of CMOS testing.   [8+7]

---ooOoo---

R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
FINITE ELEMENT METHODS
(Common to AE, ME)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) Describe in short a procedure to solve an engineering problem with the help of Finite Element Analysis.

  b) The governing equation for a fully developed steady laminar flow of a Newton as shown in figure 1.

Figure 1

$$\mu \frac{d^2v}{dx^2} + pg\cos\theta = 0$$
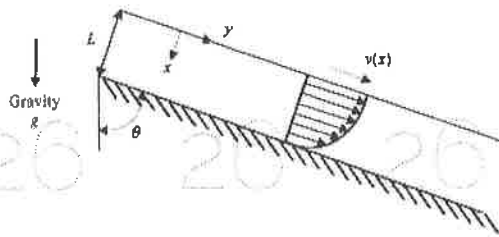
Where
    μ = coefficient of viscosity,
    v = fluid velocity,
    ρ = density,
    g = acceleration due to gravity,
    θ = angle between the inclined surface and the vertical,
The boundary conditions are given by

$$\frac{dv}{dx}\Big|_{x=0} = 0 \quad (zero\ shear\ stress)$$
$$v(L) = 0 \quad (no\ slip)$$

Let us find the velocity distribution $v(x)$ using the weighted residual method. Assume a trial solution

$$v(x) = \hat{v}(x) = c_0 + c_1 x + c_2 x^2 \hspace{4cm} [5+10]$$

2.a) What do you understand by quadratic shape functions?
  b) Rod under distributed and concentrated forces and subjected to forces as shown in figure 2.   [5+10]
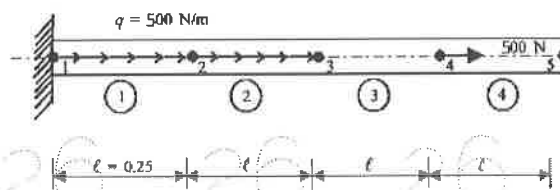

Figure 2

3. For the three-bar truss shown in figure 3, determine the displacements of node 1 and the stress in element 3. [15]
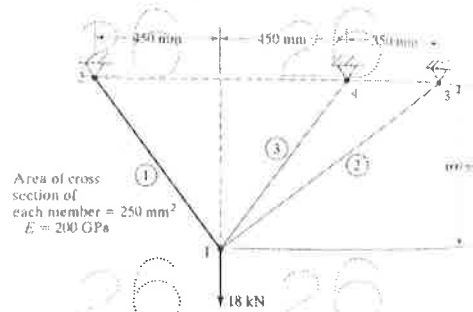

Figure 3

4. For the beam problem shown in figure 4, determine the tip deflection and slope at the roller support. [15]
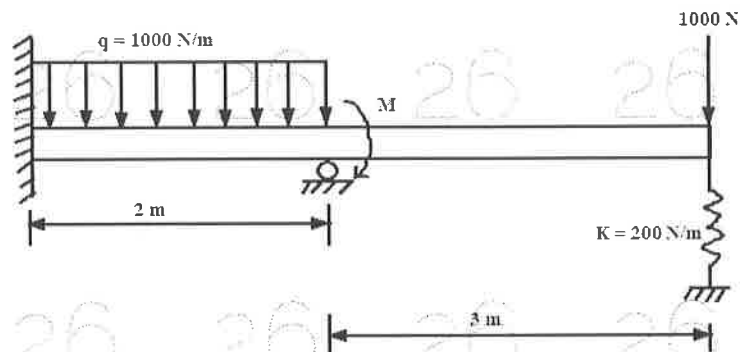

Figure 4

5. Determine the deflection of a thin plate subjected to extensional loads as shown in figure 5. [15]
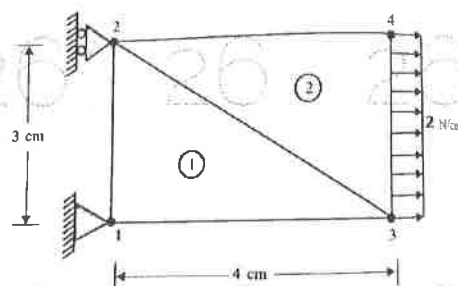

Figure 5

6. Determine the Jacobian of the transformation J for the triangular element shown in figure 6. [15]
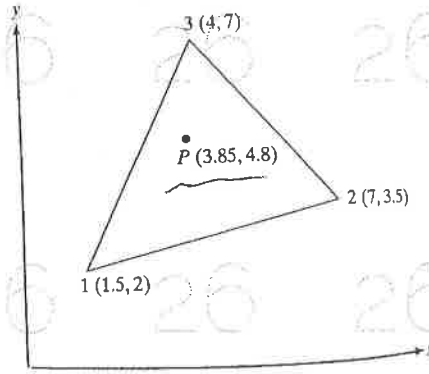

Figure 6

7. The plane wall shown in figure 7. Is 0.5 m thick? The left surface of wall is maintained at a constant temperature of 200 ^{0}C, and the right surface is insulated. The thermal conductivity k=25W/m^{0}C, and there is uniform heat generation inside the wall of Q = 400 W/m^3. Determine the temperature distribution through the wall thickness using linear elements. [15]
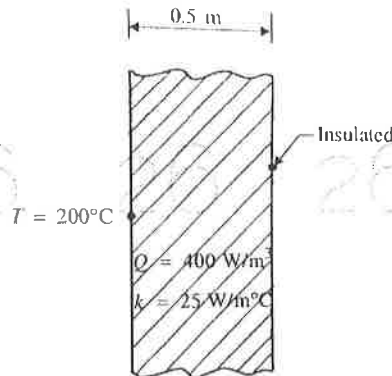

Figure 7

8.a) Differentiate between consistent and lumped mass matrices.

b) Consider a uniform cross-section (in figure 8) bar of length L made up of a material whose Young's modulus and density are given by E and ρ. Estimate the natural frequencies of axial vibration of the bar using consistent mass matrices. [5+10]
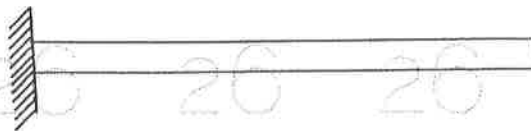

Figure 8

---ooQoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
POWER SEMICONDUCTOR DRIVES
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) Explain the operation of a single-phase fully controlled rectifier fed separately excited dc motor. Assume continuous conduction and draw relevant waveforms.

b) The speed of a 20 HP, 210V, 1000rpm d.c. series motor is controlled by a single-phase semi converter and full converter. The combined field and armature resistance is 0.25 Ω. Motor constants are $K_{af} = 0.03$N-mA^2 and K_{res}=0.075V-s/rad. The Supply voltage is 230 V. Assuming continuous and ripple free motor current, determine the following for firing angle of 30^0 and speed of 1000 rpm: (i) Motor Torque (ii) Motor Current.   [8+7]

2. Explain the motoring and braking operation of a three-phase fully controlled rectifier fed separately excited d.c. motor with the help of relevant voltage and current waveforms. Assume continuous conduction. Obtain the expression for average output voltage 15.   [15]

3.a) Draw the block diagram and explain the operation of closed-loop speed control with inner-current loop and field weakening.

b) A 400v, 750 rpm, 70A dc shunt motor has an armature resistance of 0.3 Ω. When running under rated conditions, the motor is to be braked by plugging with armature current limited to 90A. What external resistance should be connected in series with the armature? Calculate the initial braking torque and its value when the speed has fallen to 300rpm   [8+7]

4.a) Deduce the mathematical expression for minimum and maximum currents for a class A chopper operated dc motor with back emf.

b) A 230 V, 1000 rpm, 30 A separately excited motor has armature resistance of 0.7 Ω and inductance of 50 mH. Motor is controlled by regenerative braking by a chopper operating at 800 Hz from a dc source of 230 V. Assuming continuous conduction
i) Calculate duty ratio of the chopper for rated torque and speed of 800 rpm
ii) What will be the motor speed for duty ratio of 0.6 and rated motor torque.   [8+7]

5.a) Explain why stator voltage control is suitable for speed control of Induction motors in fan and pump drives. Draw a neat circuit diagram for speed control of scheme of 3-phase Induction motor using AC Voltage Controller.

b) A 440V, 3 phase, 50 Hz, 6-pole, 945 RPM delta connected Induction Motor has the following parameter referred to the stator.
$R_S = 2.0$ Ω, Rr = 2.0 Ω, $X_S = 3$ Ω, Xr = 4 Ω.
When driving a fan load at rated voltage it runs at rated speed. The motor speed is controlled by stator voltage control. Determine motor terminal Voltage, current and torque at 800 RPM.   [8+7]

6.a) With a block schematic diagram explain how the speed of the Induction motor can be controlled automatically (i.e., using closed loop scheme) with Voltage Source Inverters. Mention the applications of the above scheme.

b) Explain the advantages of variable frequency drives. [8+7]

7.a) Explain the following with respect to slip energy recovery scheme
i) Speed range ii) rating of the drive
iii) Transformation ratio of the motor iv) line side power factor

b) A 3 Phase, 400V, 50 Hz, 10 KW 960 rpm, 6 pole star connected slip ring Induction motor has the following constants referred to the stator. Rs = 0.4 Ω, R'r = 0. 6 Ω, Xs = Xr' = 1.4 Ω. The motor drives a fan load at 960 rpm. The Stator to rotor turns ratio is 2. What resistance must be connected in each phase of the rotor circuit to reduce the speed to 800 rpm? [8+7]

8. How is the output voltage of a VSI improved by PWM techniques? Explain how you will use this converter for speed control of a synchronous motor. [15]

---ooOoo---

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
ENVIRONMENTAL ENGINEERING
(Civil Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks

- - -

1.a) What do you mean by water borne disease? And enlist five water borne diseases along with their common symptoms.

b) Following is the population of a town recorded from the census department.

Year   1990   2000   2010
Population   15000   21000   29500
Determine i) the saturation population ii) expected population in 2020.   [8+7]

2.a) What are the common types of sedimentation tanks?

b) Design a circular sedimentation tank for the treatment of sewage for the treatment of sewage.
Population = 3,00,000 Per capita water supply = 180 lpcd
Maximum sewage = 1.5 times average sewage
Surface loading rate = 1.5 cu.m/ m^2/hour   [8+7]

3.a) Explain the theory of filtration.

b) Design a rapid sand filter unit to supply water at the rate of 130 LPCD to a small town of population 85,000 souls. Assume suitable data required.   [6+9]

4.a) Explain the factors influencing chlorination of water supplies.

b) Design six slow sand filter beds from the following data and show the arrangements in bed. Population to be served: 65000, Quantity of water to be supplied: 200lpcd, Rate of filtration: 300 liters/m^2/hr, Length of each bed is twice the breadth.   [8+7]

5.a) Explain the functions and location of scour valve with the help of a neat sketch.

b) Explain the Hardy-Cross method and derive the equation for corrected discharge using the method of balancing heads by correcting assumed flows.   [8+7]

6.a) What do you understand by the terms 'self cleansing velocity' and 'limiting velocity' in sewers.

b) A circular sanitary sewer designed to carry the maximum flow of sewage while flowing 70% (i.e., at 0.7 depth) full at a velocity of 1.2 m/sec. If the ratio of (Maximum / Average) and (Average / Minimum) flows are 2.5 and 2.0 respectively. Find out:
i) The proportionate depth of flow,
ii) The velocities of flow generated at the time of average flow, and at the time of minimum flow. Neglect variations in the value of 'n' the coefficient of roughness of sewer.   [8+7]

7.a) Give a list of methods available for treatment of wastewater.

b) The effluent from a primary settling tank is applied to a standard rate filter at the rate of 4 million liters per day, having a BOD_5 of 185 mg/l. Determine the depth and volume of filter, adopting a surface loading of 2000 $l/m^2/day$ and an organic loading of 150 $g/m^3/day$. Also, determine the efficiency of such filter unit, using NRC formula. [8+7]

8.a) What do you understand by aerobic digestion? What are its advantages and disadvantages?

b) Write a note on sludge conditioning. Why elutriation is necessary before chemical conditioning? [8+7]

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R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year II Semester Examinations, December-2017
PHARMACEUTICAL TECHNOLOGY – II

Time: 3hours   Max.Marks:75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question
carries 10 marks and may have a, b, c as sub questions.

PART- A   (25 Marks)

1.a)	Define buccal and sublingual tablets.	[2]
b)	Write different types of gastro retentive drug delivery systems.	[3]
c)	Write different types of coating for tablet coating. Write their importance.	[2]
d)	Write the formulation of coating material.	[3]
e)	What are processing problems in capsule manufacturing?	[2]
f)	Enumerate microencapsulation techniques? Write its importance.	[3]
g)	Write the different routes of administration of parenteral preparation?	[2]
h)	Write steps in prefilling treatment of parenteral products?	[3]
i)	Write the principle in steam and hot sterilization techniques?	[2]
j)	What services and maintenance is required for aseptic area.	[3]

PART-B   (50 Marks)

2.a)	Write the formulation and evalation of fast dissolving tablets.	
b)	Explain the working of compression machine with a neat diagram.	[10]

OR

3.a)	Write the formulation of matrix tablets.	
b)	Write about the rapid mixer granulation.	[10]

4.	Write the brief note on equipments used for coating.	[10]

OR

5.	Write the evaluation tests for coated tablets.	[10]

6.a)	Explain the automatic capsule filling process in detail.	
b)	Write principle and methods of coacervation phase separation methods.	[10]

OR

7.	Write the difference between spray drying and spray congealing. Write the advantages and disadvantages of both methods.	[10]

8.	Define isotonicity and write their methods of adjustment.	[10]

OR

9.a)	What is lyophillization? How it can be helpful in preparation of sterile powders?	
b)	Write brief note on ampoules sealing.	[10]

10.	Write the sources of contamination and its prevention.	[10]

OR

11.	Write brief note on aseptic area and laminar air flow benches.	[10]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year II Semester Examinations, December-2017
MEDICINAL CHEMISTRY - I

Time: 3hours   Max.Marks:75

Answer any five questions
All questions carry equal marks
- - -

1.   Explain in detail about Phase I metabolic reactions with suitable examples.
                                                                             [15]

2.a)   Classify antipsychotics with examples and give their structures.
  b)   Write the synthesis of Clozapine and Oxypentine.   [15]

3.a)   Classify general anesthetics with examples and give their structures.
  b)   Explain in detail about the SAR of barbiturates.   [15]

4.a)   Classify antidepressant drugs with examples and give their structures.
  b)   Write short notes on Amphetamine.   [15]

5.a)   Classify anti-cholinergic drugs with examples and give their structures.
  b)   Write the synthesis of Neostigmine and Lidocaine.   [15]

6.   Explain in detail about the structure, nomenclature, mechanism of action and
       synthesis of Phenytoin and Imipramine.   [15]

7.a)   Write short notes on bio isosterism and steric features of drugs.
  b)   Write the application of hydrogen bonding in drug design.   [15]

8.a)   Write short notes on Prostaglandin E1.
  b)   Write short notes on clinically used Prostaglandins.   [15]

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R13

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) Mention the types of failures in a bolted joint. [2]
 b) What are the advantages and disadvantages of welded connections? [3]
 c) What is slenderness ratio of a column [2]
 d) What is effective length of a compression member if it is effectively held in position at both ends and restrained against rotation? The unsupported length is 4m. [3]
 e) Define shape factor. [2]
 f) List the various factors affecting the lateral-torsional buckling strength of beams. [3]
 g) When the seated beam connections are preferred and name the types? [2]
 h) Explain the stiffened seat connection with neat sketch. [3]
 i) Why the bearing stiffener is provided in plate girder? [2]
 j) What is the curtailment of flange plates and what is the necessasity of curtailment of flange plates in the plate girder [3]

PART - B

(50 Marks)

2. Two plates 200 × 8mm of grade 410 are connected by bolts of diameter 20mm of grade 4.6 using butt joint. Design the bolted connection to transmit a pull equal to the strength of the plate. Also sketch the arrangement of bolts in the joint. [10]

OR

3. An unequal angle 1.5m long is connected to a gusset plate, It carries an ultimate tension of 260kN. Design the section using 4mm weld. [10]

4. Design a column with single lacing system to carry a factored axial load of 1600kN. The effective length of column is 5m. Use two channels placed toe to toe. [10]

OR

5. Design a compound column to carry an axial load of 1000 kN. The column consists of two channels placed back to back and laced together. Take effective length of column is 5m. [10]

6. A simply supported beam of span 5m carries a UDL of 20kN/m. In addition to UDL the beam is carrying a central point load of 80kN. The beam is laterally supported. Design the section and check the section for shear and deflection. [10]

OR

7. ISMB 550 @1.037 kN/ m has been used as simply supported over a span of 5 m. The ends of beam are restrained against torsion but not against lateral bending. Evaluate the safe UDL per metre, which the beam can carry. [10]

8. Design a bracket connection to transfer an end reaction of 300 kN due to factored loads as shown in Figure below. The end reaction from the girder acts at an eccentricity of 300 mm from the face of the column flange. Design bolted joint connecting the Tee-flange with the column flange. Steel is of grade Fe 410 and bolts of grade 4.6. [10]
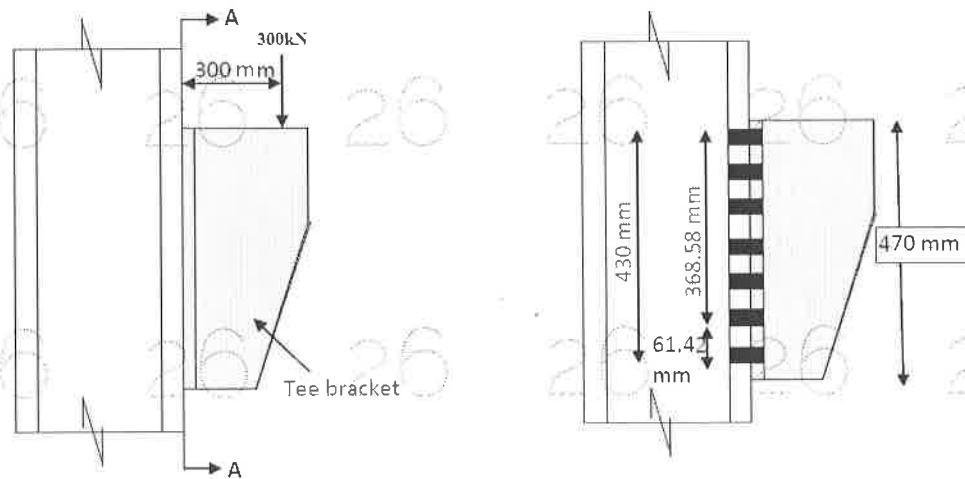
OR

9. Design a stiffened seat connection for an ISMB 350@ 514 N/m transmitting an end reaction of 350 kN (due to factored loads) to a column section ISHB 300 @ 576.8 N/m. The steel is of grade Fe 410 and bolts of grade 4.6. [10]

10. Design a welded plate girder of span 30m to carry a super imposed load of 40kN/m. Avoid use of bearing and intermediate stiffeners. [10]

OR

11. A plate girder of span 15m is made-up of web plates of 1600mm × 8mm flange angles 150mm × 115mm × 10mm and two flange plates 480mm × 10mm. It carries a uniformly distributed load of 100kN/m including its own weight. Design and sketch the web splices at 6m from one end. [10]

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Code No: 126EK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
DIGITAL SIGNAL PROCESSING
(Common to ECE, EIE)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART – A

(25 Marks)

1.a) Define stability. [2]
b) List the applications of Z- transform. [3]
c) List the properties of DFS. [2]
d) What is the value of x(n)*h(n), $0 \leq n \leq 11$ for the sequences x(n)={1,2,0,-3,4,2,-1,1,-2,3,2,1,-3} and h(n)={1,1,1} if we perform using overlap save fast convolution technique? [3]
e) Why do we go for analog approximation to design a digital filter? [2]
f) Discuss about the pole locations for the digital Chebyshev filters. [3]
g) Compared different window Techniques. [2]
h) What conditions are to be satisfied by the impulse response of an FIR system in order to have a linear phase? [3]
i) Define up sampling and Down sampling. [2]
j) What are the issues in quantization during analog to digital conversion? [3]

PART - B

(50 Marks)

2.a) Check whether the following systems are stable, causal.
(i) $h(t) = te^{at} u(t)$ (ii) $h(n) = e^{n^2} u(n-4)$

b) Determine the impulse response of the system described by the difference equation y(n)-3y(n-1)-4y(n-2)=x(n)+2x(n-1) using Z transform. [4+6]

OR

3.a) A system is described by the difference equation y(n)-y(n-1)-y(n-2) = x(n-1). Assuming that the system is initially relaxed, determine its unit sample response h(n).
b) Show that an LSI system can be described by its unit step response. [6+4]

4. Implement the Decimation in frequency FFT algorithm of N-point DFT where N-8. Also explain the steps involved in this algorithm. [10]

OR

5.a) If $x(n)$ is a periodic sequence with a period N, also periodic with period 2N. $X_1(K)$ denotes the discrete Fourier series coefficient of $x(n)$ with period N and $X_2(k)$ denote the discrete Fourier series coefficient of $x(n)$ with period 2N. Determine $X_2(K)$ in terms of $X_1(K)$.

b) What is FFT? Calculate the number of multiplications needed in the calculation of DFT using FFT algorithm with 32 point sequence. [5+5]

6.a) Find the order and poles of a low pass Butterworth filter that has a -3db bandwidth of 500 Hz and an attenuation of 40db at 1KHz.

b) Compare the impulse invariance and bilinear transformation methods. [6+4]

OR

7. Explain design of IIR digital filter using Impulse Invariant Techniques. [10]

8. Design a low pass digital FIR filter using Kaiser window satisfying the specifications given below.
Pass band cut-off frequency = 150 Hz.
Stop band cut-off frequency = 250 Hz.
Pass band ripple = 0.1dB
Stop band attenuation = 40 dB
Sampling frequency = 1000 Hz. [10]

OR

9. Design a high pass filter using hamming window with a cut-off frequency of 1.2 radians/second and N=9. [10]

10.a) Give the frequency domain analysis of Decimator.
b) Briefly discuss the dead –band effects. [5+5]

OR

11.a) Explain the necessity of multirate signal processing and hence define decimation and interpolation
b) Discuss the role of finite length representation and the associate errors. [5+5]

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Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	Define structural testing.	[2]
b)	What are remedies for test bugs? Explain.	[3]
c)	Give an example of forgiving Data Flow anomaly state graph.	[2]
d)	Explain about path selection in transaction-flow testing.	[3]
e)	What is domain testing?	[2]
f)	Where do domains come from?	[3]
g)	Write absorption rule.	[2]
h)	What goes wrong with predicates?	[3]
i)	What is the problem with pictorial graphs?	[2]
j)	Explain state-transition table with example.	[3]

PART - B

(50 Marks)

2.a)	Explain link markers and link counters with example.	
b)	Discuss about integration, interface and system bugs.	[5+5]
	OR	
3.a)	What are cases for single loop? Explain with examples.	
b)	Distinguish between testing and debugging.	[5+5]
4.a)	Why isn't static analysis enough? Why is testing required? Could not a vastly expanded language processor detect anomalies?	
b)	Explain about sensitization in transaction-flow testing.	[5+5]
	OR	
5.a)	Describe application, tools and effectiveness of data-flow testing.	
b)	Discuss about transaction-flow structure.	[5+5]
6.a)	Explain about testing two-dimensional domains.	
b)	Discuss about closer compatibility and span compatibility.	[5+5]
	OR	
7.a)	What are ugly domains? How testers and programmers treat them.	
b)	Explain about linearizing and coordinate transformations.	[5+5]

8.a) Explain loop term step in a reduction procedure with example.
  b) Discuss about decision tables and structure with example. [5+5]

OR

9.a) Describe lower path count arithmetic with example.
  b) Write motivational overview of logic-based testing. [5+5]

10.a) What is equivalent state? Explain in detail.
  b) Explain about node-reduction algorithm. [5+5]

OR

11.a) Give an example to illustrate how to convert a specification into a state graph and how contradictions can come about.
  b) Discuss about win-runner testing tool. [5+5]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
HEAT TRANSFER
(Common to AME, MSNT, ME)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.
Assume suitable data, if necessary:

PART - A
(25 Marks)

1.a)   Give some examples of heat transfer in engineering.   [2]
  b)   State Fourier's law of heat conduction? Why the negative sign is used.   [3]
  c)   What is heat generation in a solid? Give examples.   [2]
  d)   What is the difference between the fin effectiveness and the fin efficiency?   [3]
  e)   Differentiate between Natural and Forced convection.   [2]
  f)   Sketch the temperature and velocity profiles in free convection on a vertical wall. [3]
  g)   What is condensation? How does it occur?   [2]
  h)   Discuss some methods of enhancing pool boiling heat transfer permanently.   [3]
  i)   What is a heat exchanger? What are its applications?   [2]
  j)   Discuss the advantage of NTU method over the LMTD method.   [3]

PART - B
(50 Marks)

2.a)   Derive conduction equation for spherical coordinate systems.
  b)   An insulated pipe of 50 mm outside diameter (ϵ=0.8) is laid in a room at 30 ^{0}C. If the surface temperatures is 250 ^{0}C and the convective heat transfer coefficient is 10 W/m^{2}K. Calculate the heat loss per unit length of pipe.   [5+5]

OR

3.a)   Does any of the energy of the sun reach the earth by conduction or convection? Explain.
  b)   A pipe 2 cm in diameter at 30^0 C is placed in (i) an air flow at 50^{0}C with h=20 W/m^{2}K and in (ii) water at 30^{0}C with h=70W/m^{2}K. Find the heat transfer rate per unit length of the pipe.   [5+5]

4.a)   Derive the expression for heat transfer in fins in case of (i) Rectangular plate fin of uniform cross section (ii) insulated end.
  b)   Determine the heat transfer rate from the rectangular fin of length 20 cm, width 40 cm and thickness 2 cm. The tip of the fin is not insulated and the fin has a thermal conductivity of 150 W/m K. The base temperature is 100^{0}C and the fluid is 20^{0}C. The heat transfer coefficient between the fin and the fluid is 30 W/m^{2}K.   [5+5]

OR

5.a) Derive the expression for heat transfer under transient mode.

b) Two large steel plates at temperatures of 120^0C and 80^0C are separated by a steel rod 300 mm long and 25 mm in diameter. The rod is welded to each plate. The space between the plates is filled with insulation, which also insulates the circumference of the rod. Because of a voltage difference between the two plates, current flows through the rod, dissipating electrical energy at a rate of 150W. Find out the maximum temperature in the rod and the heat flux. Take k for the rod as 47 W/m K.   [5+5]

6.a) State Buckingham pi theorem . What are the merits and demerits?

b) Air at 200 kPa and 200^0C is heated as it flows through a tube with a diameter of 25 mm at a velocity of 10 m/sec. The wall temperature is maintained constant and is 20^0C above the air temperature all along the length of tube. Calculate: (i) The rate of heat transfer per unit length of the tube. (ii) Increase in the bulk temperature of air over a 3 m length of the tube.   [5+5]

OR

7.a) A 2.2cm outer diameter pipe is to cross a river at a 30m wide section while being completely immersed in water The average flow velocity of water is 4 m/s and the water temperature is 15^0C. Determine the drag force exerted on the pipe by the river.

b) A steam pipe 10 cm OD runs horizontally in a room at 23^0 C. Take outside temperature of pipe as 165^0 C. Determine the heat loss per unit length of the pipe. Pipe surface temperature reduces to 80^0 C with 1.5 cm insulation. What is the reduction in heat loss?   [5+5]

8.a) Explain what do you mean by absorptivity, reflectivity and transmissivity.

b) Estimate the power required to boil water in a copper pan, 0.35m in diameter. The pan is maintained at 120^0C by an electric heater. What is the evaporation rate? Estimate the critical heat flux.   [5+5]

OR

9.a) Write expression for blackbody radiation.

b) A thin aluminium sheet with an emissivity of 0.1 on both sides is placed between two very large parallel plates that are maintained at uniform temperatures T_1 = 800 K and T_2 = 500 K and have emissivities $\epsilon_1'' = 0.2$ and $\epsilon_2'' = 0.7$ respectively. Determine the net rate of radiation heat transfer between the two plates per unit surface area of the plates and compare the result to that without shield.   [5+5]

10.a) Derive NTU of parallel flow and counter flow heat exchangers.

b) In a Double pipe counter flow heat exchanger 10000 kg/h of an oil having a specific heat of 2095 J/kgK is cooled from 80^0C to 50^0C by 8000 kg/h of water entering at 25^0C. Determine the heat exchanger area for an overall heat transfer coefficient of 300 W/m^{2}K. Take Cp for water as 4180 J/kgK.   [5+5]

OR

11.a) Derive an expression for effectiveness of counter flow heat exchanger.

b) After a long time in service, a counter flow oil cooler is checked to ascertain if its performance has deteriorated due to fouling. In the heat transfer surface is 3.33 m^2 and the design value of the overall heat transfer coefficient is 930 W/m^{2}K, how much has it been reduced by fouling? Cp of oil as 2330 J/kg K and cp of water as 4174 J/kgK. [5+5]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
ELECTRICAL AND ELECTRONICS INSTRUMENTATION
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	How can you extend the range of an ammeter?	[2]
b)	Enlist the advantages of PMMC instrument.	[3]
c)	Compare AC and DC potentiometers.	[2]
d)	How can you measure unknown resistance using DC potentiometers?	[3]
e)	What are the main sources of errors in energy meters?	[2]
f)	Draw the circuit diagram of three phase power measurement using 2 wattmeters method.	[3]
g)	What are the DC measuring bridges?	[2]
h)	Draw the circuit diagram of Owen's bridge and write the application of its.	[3]
i)	What are the applications of CRO?	[2]
j)	What are the main characteristics the transducers?	[3]

PART - B

(50 Marks)

2.a) A basic d' Arsonval meter movement with an internal resistance, $Rm = 100\Omega$ and a full scale current of $I\,wm = 1mA$ is to be converted in to a multi range D.C. voltmeter with ranges of 0-10V, 0- 50V, 0- 250V and 0-500V. Find the values of various resistances required for potential divider arrangement.

b) Explain the principle of operation of Quadrant electrometer type Electrostatic voltmeter and mention its applications. [5+5]

OR

3.a) Describe the construction and working principle of attraction type moving iron instrument.

b) How can you extend the range of Electro static Voltmeters? Explain. [5+5]

4.a) Explain the Principle of operation of Polar type AC potentiometer with a neat sketch.

b) What is the need of Potential transformer? And describe about different errors occurred in PTs. [5+5]

OR

5.a) Reduce the ratio error of current transfer with necessary sketches.

b) What are the types of instrument transformers? Compare them. [5+5]

6.a) Prove that for electrodynamometer type wattmeter

true power = {cos Φ / [cos β cos ($\Phi - \beta$]} x actual wattmeter reading

Where cos Φ = power factor of the circuit

β = tan-1 (ωL/R) where L and R are the inductance and resistance of the pressure coil of the circuit.

b) Explain the operation of induction type energy meter and explain how you can provide overload compensation to it. [5+5]

OR

7.a) How can you test energy meter by phantom loading? Explain with a neat sketch.

b) Explain the construction and working of three element wattmeter with a neat sketch. [5+5]

8.a) Draw the block diagram of wheatstone bridge with digital readout and explain its operation.

b) Draw the circuit diagram of Maxwells inductance bridge and derive a relation for unknown Inductance. [5+5]

OR

9.a) How could you measure insulation resistance using loss of charge method? Describe with the help of diagram.

b) Draw the circuit diagram of Schering bridge and derive a relation for unknown capacitance. [5+5]

10.a) Explain the working of CRT with a neat sketch.

b) What is the principle of strain guage? And derive a relation for gauge factor. [5+5]

OR

11.a) Explain the working principle of Thermisters, mention advantages and applications of them.

b) Describe the principles of operation of capacitive transducers and mention their applications. [5+5]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
REFRIGERATION AND AIR CONDITIONING
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

Assume suitable data, if necessary:

1.a) Draw p-h and T-s diagrams for the actual air refrigeration system and discuss the salient points.
  b) An air refrigerator works between the pressure limits of 1 bar and 5 bar. The temperature of the air entering the compressor and expansion cylinder are 10^0 C and 25^0 C respectively. The expansion and compression follow the law $pv^{1.3} = C$. Find the following: i) The theoretical C.O.P of refrigerating cycle; ii) If the load on the refrigerating machine is 10TR, find the amount of air; circulated per minute through the system assuming that the actual C.O.P is 50% of the theoretical C.O.P.   [7+8]

2.a) What are the effects of sub cooling and superheating on the net refrigerating effect, work required and COP of vapour compression refrigeration system? Explain along with p-h diagrams.
  b) The vapour compression refrigeration cycle refers to a 20 TR ice plant using ammonia as refrigerant. The temperature of water entering and leaving the condenser are 20^0C and 27^0C respectively and temperature of brine in the evaporator is -15^0 C. Before entering the expansion valve, ammonia is cooled to 20^0 C and enters the compressor dry saturated. Calculate for 1 tone of refrigeration the power expended the amount of cooling water in the condenser and C.O.P of the plant.   [7+8]

3.a) Explain the working principle of thermostatic expansion valve used in the simple vapour compression refrigeration system along with the suitable diagram.
  b) How to control the Ozone Depletion and Global Warming Potential based on the refrigerants used? Explain.   [7+8]

4.a) In an absorption type refrigerator, the heat supplied to NH_3 generator by condensing steam at 2 bar and 90% dry, the temperature in the refrigerator is to be maintained at -5^0 C. Find the maximum C.O.P possible. If the refrigeration load is 20 tonnes and actual C.O.P is 70% of the maximum C.O.P., find the mass of steam required per hour. Take the temperature of the atmosphere as 30^0 C.
  b) Explain the function of each fluid in a 3-fluid vapour absorption system and discuss the properties of all the three fluids.   [7+8]

5.a) Draw the schematic diagram of steam ejector type refrigeration system and explain the working principle of each component.
  b) Discuss the constructional features of vortex tube refrigeration system with a suitable diagram.   [7+8]

6. The total sensible and latent heat loads in a theatre are 1,50,00 kJ/hr and 62,000 kJ/hr respectively. The outdoor conditions are 35^0C DBT and 29^0C WBT. The indoor conditions are 22^0C DBT and 50% RH. The ventilation air required for the theatre is 170m^3/min. The temperature of the air entering the theatre should not exceed 14.5^0C. Calculate the following: (a) Conditions of air entering and leaving the conditioner; (b) The flow rate of air passing through the conditioner; (c) The cooling coil capacity.

[15]

7.a) What is the method adopted for the estimation of cooling loads for the air conditioning unit by taking into the account of all the equipment? Explain.

   b) A laboratory has 27 kW sensible and 23 kW latent heat load. The inside design conditions of air are 20^0C DBT and 53% R.H. and outside design conditions of air are 38^0C DBT and 25^0C WBT. The ventilation air used is 76 m^3/min. A cooling coil with a bypass factor of 0.06 must be used. An apparatus DPT is 8^0C. Determine (i) Amount of reheat required, (ii) Supply air quantity, (iii) DBT and WBT of air entering and leaving the apparatus, (iv) Supply of air temperature.

[15]

8.a) Explain the principle of working of different types of heat pumps used for the room heating.

   b) What is meant by ventilation and why it is required? Explain them briefly. [8+7]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
NUMERICAL METHODS
(Automobile Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks
- - -

1.a) Find root of the equation $x\log_{10}(x) = 1.2$ using False position method.
  b) Find the root of the equation $3x - \sqrt{1 + sinx} = 0$ by iteration method. [7+8]

2.a) Solve the following equations using Gauss-Elimination method.
     $2x_1 + x_2 + x_3 = 10; 3x_1 + 2x_2 + 3x_3 = 18; x_1 + 4x_2 + 9x_3 = 16.$
  b) Solve the system of equations using Jacobi iteration method: [7+8]
     $4x + y + z = 2; x + 5y + 2z = -6; x + 2y + 3z = -4.$

3.a) If δ be the operator with usual meaning and if $hD = U$ where h is the interval of differencing then prove that $\frac{U}{\delta} = \frac{2}{\delta}sinh^{-1}\frac{\delta}{2} = 1 - \frac{\delta^2}{24} + \frac{3}{640}\delta^4 + \frac{5}{7168}\delta^6 + o(\delta)^8$.
  b) Given $u_0 + u_8 = 1.924; u_1 + u_7 = 1.959; u_2 + u_6 = 1.982$ and $u_3 + u_5 = 1.996$ find u_4, stating the assumption made. [7+8]

4.a) Fit a polynomial of second degree to the data points (2, 3.07), (4, 12.85), (6, 31.47), (8, 57.38) and (10, 91.29).
  b) Find σ_y and r from the following data: [7+8]
     $3x = y; 8y = 6x$ and $\sigma_x = 4$.

5.a) A rocket is launched from the ground. Its acceleration measured every 5 seconds is tabulated below. Find the velocity and the position of the rocket at t = 40 seconds.

T	0	5	10	15	20	25	30	35	40
$a(t)$	40.00	45.25	48.50	51.25	54.35	59.48	61.50	64.30	68.70

  b) Find $f'(6)$ from the following data: [7+8]

x	0	2	3	4	7	9
f(x)	4	26	58	112	466	922

6. Solve numerically $\frac{dy}{dx} = 2e^x - y$ at 0.4, 0.5 by Milne's predictor and corrector method, given their values at the four points x = 0, 0.1, 0.2, 0.3, y_0 = 2.000, y_1 = 2.010, y_2 = 2.010, y_3 = 2.090. [15]

7.a) Explain the concept employed in the finite difference method.

b) Find the largest eigen value λ_1 and the corresponding eigenvector V_1 of the matrix $\begin{bmatrix} 1 & 2 & 0 \\ 2 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$ using the power method. [7+8]

8.a) Derive a difference equation to represent a Poisson equation.

b) Solve the equation $\nabla^2 f = F(x, y)$ with $F(x, y) = xy$ and $f = 0$ on boundary. The domain is a square with corners at $(0, 0)$ and $(4, 4)$. Use $h = 1$. [7+8]

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Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A   (25 Marks)

1.a) Explain how the physico-chemical properties of drug molecules will affect the biological activity by taking partition-coefficient and Ionization as example. [2]
  b) Describe how hydrogen bonding will change the biological activity of drug molecules. [3]
  c) Describe the synthesis of doxepine. [2]
  d) What is benzocaine? Explain how benzocaine will act as anesthetic agents. [3]
  e) Give the structure of salbutamol. [2]
  f) Explain the mode of action of Neuromuscular blockers, succinyl choline. [3]
  g) Give the structure of nimsulide. [2]
  h) Give the structure and uses of ibuprofen. [3]
  i) Give the structure of enalapril. [2]
  j) Give a brief account of Antihypertensives. [3]

PART-B   (50 Marks)

2. Describe in detail about the Pro and soft drug approaches with suitable examples. [10]

OR

3. Explain in detail about the Phase-II reactions taking place in the drug metabolism. [10]

4.a) Write a brief account of alprazolam. Give its mode of action.
  b) Explain how Phenytoin will act as Anti-epileptic drug. [5+5]

OR

5.a) What are Anti-psychotic drugs? Describe their general mode of action.
  b) Outline the synthesis of Chlorpromazine. [5+5]

6. Describe the synthesis of atropine. Explain its mode of action. [10]

OR

7.a) Explain how Isoproterenol is acting as adrenergic agents and adrenergic blockers.
  b) Give the synthesis of Carbachol. [5+5]

8.a) What are analgesics and NSAIDS (Non-steroidal anti-inflammatory agents)?
  b) Give the Classification and systematic development of analgesics of morphine. [5+5]

OR

9. Explain how indomethacin will act as NSAIDS. Give its mode of action. [10]

10. Give a detail account of cardiovascular diseases. How chemotherapy will help to eradicate the General account of cardiovascular diseases. [10]

OR

11.a) What are Anti-arrhythmics? Give the synthesis of procainamide.

b) Explain the Mechanism of action of acetazolamide as Diuretics. [5+5]

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Code No: R9503

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year II Semester Examinations, December-2017
PHARMACOLOGY - II

Time: 3hours   Max.Marks:75

Answer any five questions
All questions carry equal marks
- - -

1.a) Write the classification of anti-hypertensive drugs?
  b) Write a note on plasma expanders?   [15]

2. Classify hypolipidemic drugs and explain mechanism of action, adverse effect of HMG-CoA reductase inhibitors?   [15]

3.a) Classify anti-arrhythmic drugs.
  b) Write the mechanism of action and adverse effect of any one class I drug? [15]

4.a) Classify diuretics.
  b) Classify anticoagulants.
  c) Write a note on aspirin as anti-platelet drug?   [15]

5. Classify oral hypoglycemic drugs. Write about mechanism of action and adverse effect of biguanides?   [15]

6.a) Write a note on synthesis, storage, destruction and receptors of histamine?
  b) Classify 5-HT antagonists.   [15]

7.a) Define and classify Bioassay?
  b) Write a note on Digitalis Bioassay?   [15]

8.a) Classify anti-asthmatic drugs.
  b) Write a note on expectorants?   [15]

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