Code. No: 11605/A

FACULTY OF ENGINEERING

B.E I-Semester (AICTE) (Suppl.) Examination, May / June 2019

Subject : Physics

Time: 3 Hours **Max. Marks: 70**

Note : Answer all questions from part – A and any five questions from Part-B

PART– A (20 Marks)

1. Explain the significance of Miller Indices?
2. Write short note on Dislocations?
3. Explain the concept of 'hole formation'?
4. Define 'Space Charge' Polarization?
5. What is the physical significance of wave function in wave mechanics?
6. State basic laws in Electricity and Magnetism?
7. Define Soft and Hard magnetic materials?
8. What are type-II superconductors?
9. Explain the stimulated emission of radiation?
10. What is Total Internal reflection?

PART –B (50 Marks)

11. Deduce Bragg's law? Discuss the experimental determination of lattice constant by powder Diffraction method?

12. Deduce an expression for equilibrium concentration of Schottky defects?

13. Explain Hall effect? Deduce an expression for Hall coefficient?

14. Deduce the plane electromagnetic wave equation in free space from Maxwell's relations?

15. Define magnetic Domain? Explain Weiss Molecular field theory of ferromagnetism?

16. Discuss Fiber drawing process by double crucible method?

17. Define Dielectric constant? Explain the determination dielectric constant by Capacitance Bridge method?

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Code No: 11608/B

FACULTY OF ENGINEERING

B.E. I – Semester (AICTE) (Supple.) Examination, May/ June 2019

Subject: Chemistry

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A & any Five questions from Part B.

PART – A (10x2 = 20 Marks)

1) Write cell notation and cell reaction for Z_n-Ag cell. 2
2) What are the advantages of Lithium-ion batteries? 2
3) Distinguish between temporary and permanent hardness of water. 2
4) Explain Waterline corrosion. 2
5) What is Co-polymerization? Give an example. 2
6) Explain the mechanism of conduction in polyactylene. 2
7) What are chemical fuels? Give two examples. 2
8) Define octane number and give its significance. 2
9) What is the concept of Green Chemistry? 2
10) What are the advantages of composites? 2

PART – B (50 Marks)

11. (a) What is Quinhydrone electrode? Write electrode potential equation using Nernst equation. 6
    (b) Calculate the electrode potential of Cu electrode immersed in 0.01M Cu^{+2} ion solution. 4

12. (a) What is alkalinity of water? Explain an experimental method of its determination. 5
    (b) Define corrosion and discuss the factors which influence the rate of corrosion. 5

13. (a) Differentiate between addition and condensation polymerization. 4
    (b) Explain the preparation, properties and applications of Kelvar and Buna-s rubber. 6

14. (a) Describe the fractional distillation of petroleum with a well labeled diagram. 6
    (b) What is ranking of coal? How proximate and ultimate analysis useful for it? 4

15. (a) Write any six principles of Green chemistry and explain their importance. 6
    (b) Explain the concept of trans-esterification in biodiesel formation. 4

16. (a) What are fuel cells? Describe the construction and working of CH_3OH-O_2 fuel cell. 5
    (b) Describe the method of softening of hard water by Reverse Osmosis. 5

17. (a) Write a note on Biodegradable polymers. 5
    (b) What are composites? Give their applications. 5

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Code No: 11084/BL

FACULTY OF ENGINEERING & TECHNOLOGY

B.E. 3/4 (CIVIL) I-Semester (Backlog) Examination, May /June 2019

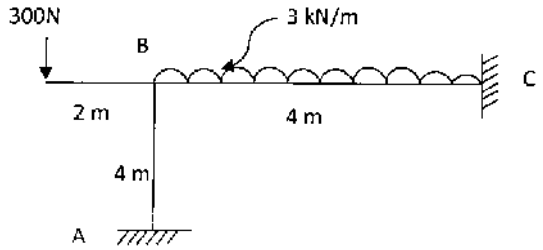
Subject: Theory of Structures-I

Time: 3 Hours **Max. Marks : 75**

Note: Answer All Questions From Part-A, & Any Five Questions From Part-B.

Part-A (25 Marks)

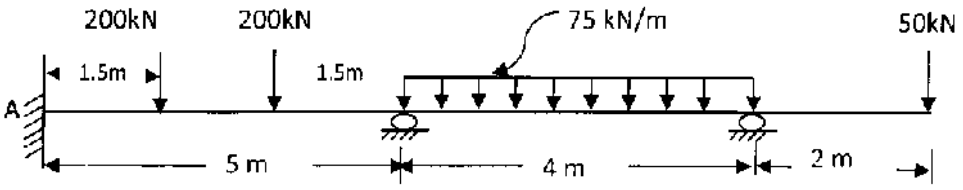
1. What are the basic assumptions in slope deflection method? (2)
2. Determine the slope at B of the frame shown in fig. (3)



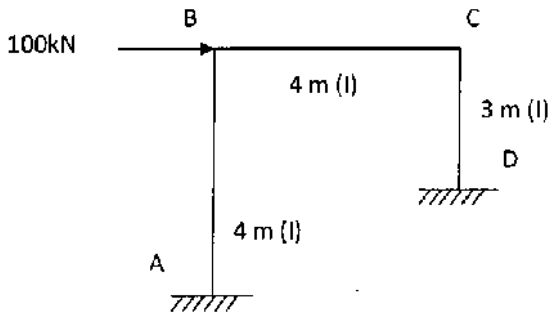
3. Derive the expression for stiffness due to unit rotation at near end when the far end is hinged. (3)
4. Define stiffness factor and carry over factor. (2)
5. What are the limitations of Kani's method? (3)
6. Sum of the rotation factors at a joint of a structure is _____. (2)
7. State Castigliano's theorem-I. (2)
8. Explain lack of fit in trusses. (3)
9. Show that the B.M. at any section of a 3- hinged parabolic arch subjected to u.d.l throughout the span is zero. (3)
10. Explain temperature effect in three hinged parabolic arch. (2)

Part-B (50 Marks)

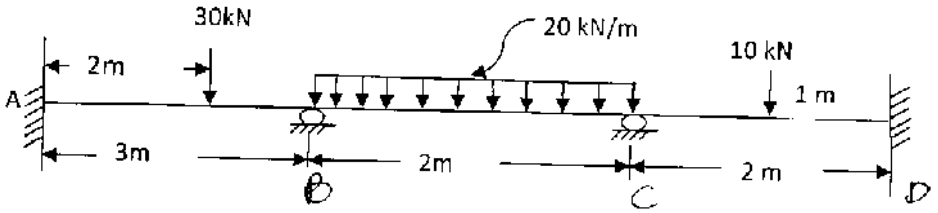
11. Analyse the beam shown in fig by slope deflection method and draw B.M.D. EI is constant. (10)



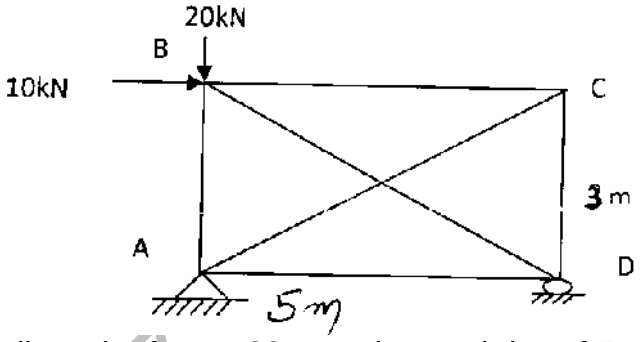
12. Analyse the frame shown in fig using moment distribution method. Draw BMD. (10)



13. Analyse the beam shown in fig below using Kani's method .Support B settles by 30 mm. Draw B.M.D. E= 200KN/mm^2 and I = 3 x 10^5 mm^4. (10)

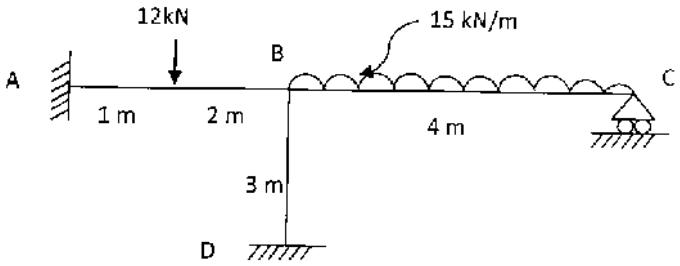


14. Determine the forces in all members of the redundant truss shown. Take A= 100 mm^2. E= 200 GPa for all members. (10)

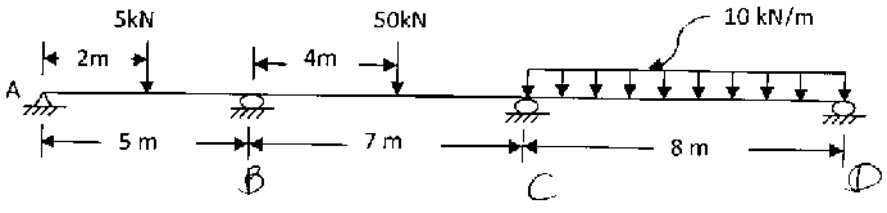


15. A three hinged parabolic arch of span 20 m and central rise of 5 m. It carries a u. d. l. of intensity 20KN/m over left half of the span. Find the B.M, normal thrust and radial shear at 4 m from left end. (10)

16. Analyse the frame shown in fig using slope- deflection method. Draw BMD. (10)



17. Analyse the continuous beam shown in fig using moment distribution method and draw B.M.D. All the members have the same flexural rigidity. (10)



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CodeNo.11090/BL

FACULTY OF ENGINEERING

B.E ¾ (EEE / Inst) I-Semester (Backlog) Examination May / June, 2019

Subject : Power Electronics

Time : 3 Hours **Max. Marks : 75**

Note : Answer all questions from Part-A & Any five questions from Part-B

Part –A (25 Marks)

1.	Why it is necessary to use fast recovery diodes for high speed applications?	2
2.	What are the differences between MOSFETs, BJT and IGBT?	3
3.	Draw the dynamic characteristics of a SCR and indicate the different parameters	3
4.	Define natural and forced commutation.	2
5.	A 230V, 50 Hz, single pulse SCR is triggered at a firing angle of 30^o and the load current extinguishes at an angle of 210^o, Find the circuits turn – off time	3
6.	Draw the output wave forms for 1-ϕ full controlled converter with R-load. Assume 75^o	2
7.	Explain time ratio control of choppers.	3
8.	What is the working principle of Cycloconverters?	2
9.	Describe the working of a single phase half bridge inverter	3
10.	List out the merits and demerits of buck boost converter	2

Part –B (50 Marks)

11.	a) Describe R and RC triggering method of a thyristor	5
	b) Explain the switching characteristics of MOSFET with necessary diagrams	5
12.	a) Draw and explain the structure of a IGBT	5
	b) Explain the two transistor analogy of a SCR	5
13.	A three phase fully controlled bridge rectifier is supplied at 230 V/phase and at a frequency of 50 Hz. The Source inductance Ls=5 mH and the load current on the dc side is constant at 12A. If the load consists of a DC source voltage of 230v having an internal resistance of 2Ω , find a) firing angle α, b) overlap angle μ	10
14.a)	Four – quadrant chopper is driving a separately excited dc motor load. The parameters are R=0.1 ohm, L = 10mH. The supply voltage is 200vd.c. If the rated current of the motor is 10A and motor is driving the rated torque. Determine (i) Duty cycle of the chopper if Eb=150V. (ii) Duty cycle of the chopper if Eb=-110V.	6
b)	Draw the output waveforms for four quadrant chopper	4
15.	Explain in detail working of 3-phase voltage source inverter. Also draw output and input wave forms for 120^o modes of operation.	10
16.	a) Explain the operation of a1- ϕ semi converter with RE-load	5
	b) Explain the working of a Buck regulator	5
17.	Write a short notes on : a) Dual converter b) Multilevel inverters	10

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Code No. 11101/BL

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I – Semester (Backlog) Examination, May / June 2019

Subject: Digital System Design with Verilog HDL

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1 What are the advantages of verilog HDL over C programming language? (2)

2 Write a verilog program for four input Exnor logic gate in data flow modeling. (2)

3 What are shift operators in verilog? Give one example (3)

4 Implement the function $F(A,B,C) = \overline{AB+C}$ using CMOS logic. (3)

5 What is meant by functional verification? (2)

6 Write a verilog model for JK Flip flop (3)

7 Draw blocks of ASM chart. (2)

8 Differentiate between synchronous and asynchronous sequential circuits. (3)

9 Draw neat diagram of BJT SRAM cell. (2)

10. Differentiate between PROM, PLA and PAL. (3)

PART – B (50 Marks)

11 a) Explain compiler directives in verilog HDL with an example. (5)

b) Write a Verilog code for 4-bit binary adder using hierarchical modeling, Define stimulus module and show sample outputs. (5)

12 a) Write Verilog code for two input NAND gate in switch level modeling. (5)

b) Write Verilog code for priority encoder using behavioral modeling and write test bench to verify its functionality. (5)

13 a) Minimize the given state table as shown in table 1 using partitioning method. (5)

Table 1: State table

Present state	Inputs	
	x=0	x=1
A	C/1	B/0
B	C/1	E/0
C	B/1	E/0
D	D/0	B/1
E	E/0	A/1

b) Explain one-hot encoding with example. (5)

14 Design sequential circuit for the given state table as shown in table 2 using D flip-flop and construct its ASM chart. (10)

Table 2: State table

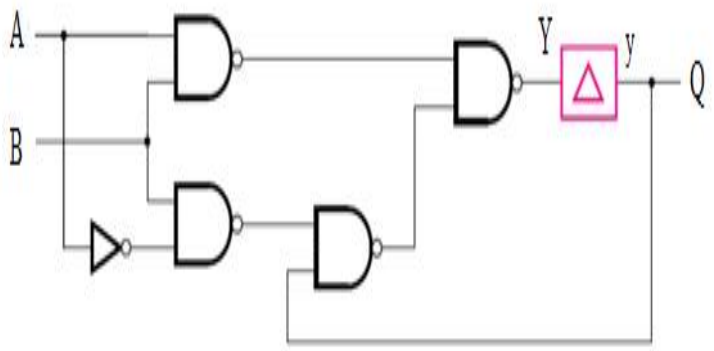
Present state	Inputs	
	x=0	x=1
A	A/00	B/01
B	C/00	B/01
C	C/00	D/10
D	A/00	D/10

15 a) Show how you obtain a 2k*8 memory using 1k*4 memory devices (5)

b) Explain ASIC and FPGA design flow. (5)

16 a) Design FSM as an arbiter circuit and write its verilog code. (5)

b) Analyze the given asynchronous sequential circuit shown below and obtain its State table and timing diagram. (5)



17 a) Explain top-down and bottom up modular designs in Verilog HDL. (5)

b) Explain Blocking and Non-blocking assignments with examples. (5)

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Code No.11104/BL

FACULTY OF ENGINEERING

B.E 3/4 (M/P) / AE I-Semester (Backlog) Examination, May / June 2019

Subject : DESIGN OF MACHINE ELEMENTS

Time: 3 hours **Max. Marks: 75**

Note: Answer all questions from Part -A and any five questions from Part –B.

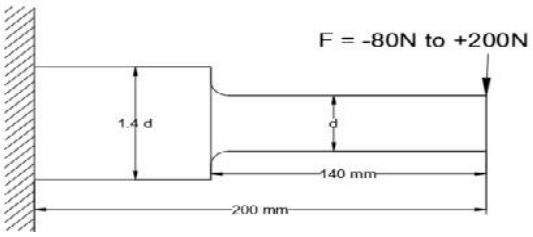
Part-A (10x2.5 =25 Marks)

1. What is meant by “Stiffness”?
2. Defines is factor of safety? For a machine element
3. Briefly explain about Hencky and von mises theory.
4. By what methods, stress concentration can be reduced? Explain with neat sketches.
5. What theories of failure are appilied in designing the shaft?
6. What is the effect of key way cut into the shaft?
7. What are the types of Cotter joints and state some applications of Cotter joints?
8. Specify some drawbacks of chain drives when compare with other drives.
9. Differentiate screw, bolt, stud and nut in their structures with neat diagrams.
10. A bolt is designated as M24 x 2. What these numbers signify?

Part-B (5x10 =50 Marks)

11. A circular rod of 60mm diameter is subjected to a bending moment of 2.5kN-m and a torsional moment of 1.5KN-m. The material of the rod has yield strength of 400MPa. Determine the factor of safety in the design according to i) Principal stress theory ii) Maximum shear stress theory iii) Distortion energy theory

12. A variable concentrated load -80N to +200N acts at the free end of a cantilever beam made of circular cross –section as shown below in figure. The theoretical stress concentration factor is 1.32 and the notch sensitivity is 0.92.The size factor and surface finish factors are given as 0.85 and 0.89 respectively. The ultimate stress and yield stress for the material of the beam are 550MPa and 470MPa respectively. Determine the diameter of beam that can withstand.



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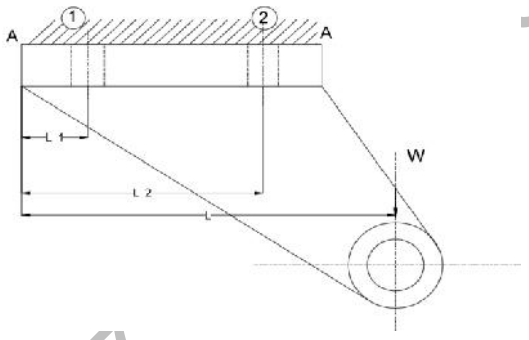
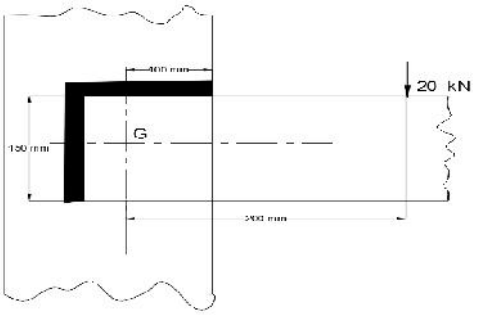
13 A shaft is supported by two bearings placed 1 m apart. A 600 mm diameter pulley is mounted at a distance of 300 mm to the right of left hand bearing and this drives a pulley directly below it with the help of belt having maximum tension of 2.25 kN. Another pulley 400 mm diameter is placed 200 mm to the left of right hand bearing and is driven with the help of electric motor and belt, which is placed horizontally to the right. The angle of contact for both the pulleys is 180° and μ = 0.24. Determine the suitable diameter for a solid shaft, allowing working stress of 63 MPa in tension and 42 MPa in shear for the material of shaft. Assume that the torque on one pulley is equal to that on the other pulley.

14. A bracket is as shown in Figure .It supports a load of 30kN. Determine the size of bolts, if the maximum allowable tensile stress in the bolt material is 60MPa. The distances are:
L_1 = 80 mm, L_2 = 250 mm, and L = 500 mm.



15. A mild steel tie-rod in a structure consists of flat 300 mm wide and 20 mm thick. It is connected to a plate of the same thickness by a double cover butt joint. If the permissible stresses are 80 MPa in tension, 65 MPa in shear and 150 MPa in crushing. Design and draw an economical Lozenge joint.

16. A bracket, as shown in Figure, below carries a load of 10kN. Find the size of the weld if the allowable shear stress is not to exceed 80MPa.



17. Write short notes on

a) Different type of keys and its applications. b) Compound and differential screws.

c) Principal stresses and principal planes. d) Design procedure of Chain drive.

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Code No.11114/BL

FACULTY OF ENGINEERING

B.E.3/4 (AE) I-Semester (Backlog) Examination, May / June 2019

Subject : DESIGN OF MACHINE COMPONENTS

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part -A and any five questions from Part-B

Part-A (10x2.5=25 Marks)

1. What are the mechanical properties?
2. What is eccentric loading and list out some applications of eccentric loading?
3. Design the shaft for transmitting a power of 20kW at 1000rpm. Assume the allowable shear stress of shaft material is 40MPa.
4. On what basis keys are selected?
5. What is meant by single start and multi start threads?
6. In what way clutches are differed from flange couplings? State four features
7. How is the efficiency of riveted joint calculated? Show the design procedre
8. Discuss the four various types of screw threads used for power screws with neat sketches.
9. In what ways shaft couplings are differed from pipe joints?
10. Draw and mention the various parts of screw jack.

Part-B (5x10=50 Marks)

11. Compare the weight, strength and stiffness of a hollow shaft of the same external diameter as that of solid shaft. The inside diameter of the hollow shaft being 0.6 times the external diameter. Both the shafts have same material and length.

12. Find the diameter of a shaft to transmit twisting moments varying from 500N-m to 2000N-m. The ultimate tensile strength is 600 N/mm^2. Yield stress is 450 N/mm^2 Assume stress concentration factor, surface finish factor and size factor are 1.2,0.8 and 0.85respectively. Take factor of safety as 2

13. Design and draw a cotter joint to support a load of 6kN. The permissible design stresses are In tension 60 N/mm^2, in crushing 90N/mm^2, in shear 40 N/mm^2

14. A plate 100 mm wide and 12.5 mm thick is to be welded to another plate by means of parallel fillet welds. The plates are subjected to a load of 50kN. Find the length of the weld so that the m maximum stress does not exceed 56MPa. Consider the joint first under static loading and then under fatigue loading. Consider the stress concentration factor for parallel fillet welding is 2.7

15. A differential band brake, as shown in Figure, has a drum diameter of 600 mm and the angle of contact is 240°. The brake band is 5 mm thick and 100 mm wide. The coefficient of friction between the band and the drum is 0.3. If the band is subjected to a stress of 50 MPa, find : 1. The least force required at the end of a 600 mm lever, and 2. The torque applied to the brake drum shaft.

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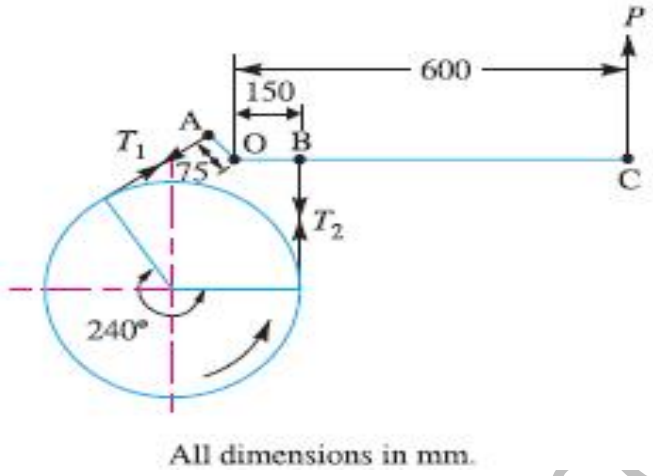

All dimensions in mm.

16. Design a diamond type joint of double cover butt riveted joining steel tie-bars 300mm wide and 20mm thick. Assume allowable stresses as 90, 75 and 150 N/mm^2- in tension, shear and crushing respectively. Also determine the efficiency of the joint.

17. Write short notes on
    a) Marine type of coupling with neat sketch.
    b) Effect of keyways on shafts.
    c) Working principles of friction clutches with the help of neat sketches.
    d) Caulking and Fullering with help of neat sketches.

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CODE NO: 11117/BL

FACULTY OF ENGINEERING

B.E 3/4 (CSE) I-semester (Backlog) EXAMINATION, May / June 2019

Subject: Automata Languages and Computation

Time: 3 Hours **Max. Marks : 75**

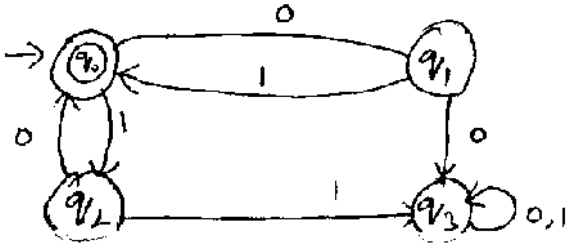
Note: Answer All Questions From Part-A, & Any Five Questions From Part-B**.**

Part-A (25 Marks)

1. Construct a DFA that accepts all strings of o's and 1's where each string starts with 'O' and ends with '01' over alphabet {0,1} 3
2. Draw NFA for regular expression o* + 1* 3
3. State the algebraic laws of regular expressions. 2
4. Stare pumping lemma for regular expressions. 2
5. What are $\in$- production and unit – production? 2
6. Give a formal definition of PDA and explain the terms in it. 3
7. What is universal language? 2
8. What is undecidability? 3
9. Explain SAT Problem. 3
10. Define inherent ambiguity 2

Part-B (50 Marks)

11. a) Draw a DFA that accepts strings containing even o of o's and ' dd no of 1's. 4
    b) Convert the given FA to regular expression using Arden's theorem. 6



12. Minimize the given DFA.

State	$\sum$	
	O	1
$\rightarrow$A	B	F
B	G	C
*C	A	C
D	C	G
E	H	F
F	C	G
G	G	E
H	G	C

…2

13 Discuss to relate the following
   a. CFG's and PDA's 5
   b. TM's and recursive Enumerable languages. 5

14 Convert the following grammer to GNF 10
   $S \rightarrow AA/0$
   $A \rightarrow SS/1$

15 a) Design a TM that accepts $a^n b^n / n \geq 1$ 5
   b) Construct PDA equivalent to the following grammer 5
   $S \rightarrow aB / bA$
   $A \rightarrow a / aS / bAA$
   $B \rightarrow b / bS / aBB$

16 a Show that PCP (Post correspondence Problem) with two lists x=(b, bab^3, ba) and y=(b^3,ba,a) has a solution give the solution sequence. 5
   b Explain Halthing problem of TM. 5

17 Give short notes on
   a Chomsky hierarchy. 5
   b Define the term 'automata' with example and differentiate NFA and DFA. 5

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Code No. 11611/O

FACULTY OF ENGINEERING

B. E. ¾ (I.T.) I – Semester (Old) Examinations, May 2019

Subject: Digital Signal Processing

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A & Any Five questions from Part-B

PART – A (25 Marks)

1. Explain circular symmetry property of DFT. [3]
2. Compare Butterworth and Chebyshev low pass filters. [3]
3. What is Gibbs phenomenon? [3]
4. What is the disadvantage with Impulse invariant method for frequency transformation? [2]
5. What are the model parameters to be estimated in the speech analysis system? [2]
6. What is meant by 'in-place' computation? [2]
7. Differentiate symmetric and antisymmetric FIR filters. [2]
8. What is the significance of guard bits? [2]
9. Explain immediate addressing, with an example. [3]
10. List the applications of programmable DSP devices. [3]

PART – B (50 Marks)

11. a) Determine whether the following systems are linear or non-linear. [5]
    i) $y(n) = x(n) + x(n-1)$
    ii) $y(n) = e^{x(n)}$
    b) Consider $x_1(n) = \{1, 0, 1, 0\}$ and $x_2(n) = \{1, 0, 0, 1\}$ Find $x_3(n)$ such that $x_3(k) = x_1(k).x_2(k)$ [5]

12. a) Explain the DIF radix-2 FFT algorithm. [5]
    b) Compute the DFT of the sequence, x(n) where x(n)=[1, 1, -1, -1, -1,-1, 1, 1]. [5]

13. Design a Chebyshev analog low pass filter for the specifications as attenuation in pass band is 3dB, attenuation in stop band 16 dB and frequency in pass band and stop band is 1 KHz, and 2 KHz respectively. [10]

14. a) Draw and explain the functional diagram of the central processing unit of TMS320C54XX processor. [6]
    b) Distinguish between Harvard architecture and Von-Neumann architecture for processors. [4]

15. a) What are the basic features of DSP processors? [4]
    b) Explain how modulo / circular addressing is achieved in DSP processors. [6]

16. Explain the DSP based biotelemetry receiver system in detail with neat diagrams. [10]

17. Write short notes on any two : [10]
    a) Overlap save method
    b) Pipelining in DSP processors
    c) JPEG algorithm

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Code No: 11120/BL

FACULTY OF ENGINEERING

BE 3/4 (IT) I-semester (Backlog) Examination, May / June 2019

Subject : Design and Analysis of Algorithms

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from part-A and any five questions from Part-B

Part-A (25 Marks)

1.	Write an algorithm for UNION and FIND with example.	3
2.	What is space and time complexity of algorithm?	2
3.	What do you mean by divide and conquer strategy?	2
4.	Define Minimum Cost Spanning tree.	3
5.	State Travelling Salesman's Problem.	2
6.	Define Biconnected Components in connected components with example.	3
7.	What is Hamiltonian cycle?	2
8.	Write the control abstraction of LC Search.	3
9.	State cook's theorem.	3
10.	What is decision problem?	2

PART – B (5x10=50 Marks)

11.	a)	What is heap? Write an algorithm for insertion of elements into heap with example.	6
	b)	Write the Collapsing Rule for FIND algorithm.	4
12.	a)	What is Knapsack problem? Explain.	3
	b)	Find the optimal solution to the knapsack instance n=3, m=20, (P1,P2,P3) = (25,24,15) and (W1, W2, W3)=(18,15,10)	7
13.		Explain the graph coloring problem and write an algorithm solution using Backtracking.	10
14.		Find the shortest path from S to T for multistage graph in figure-1 using Dynamic Programming using forward approach.	10

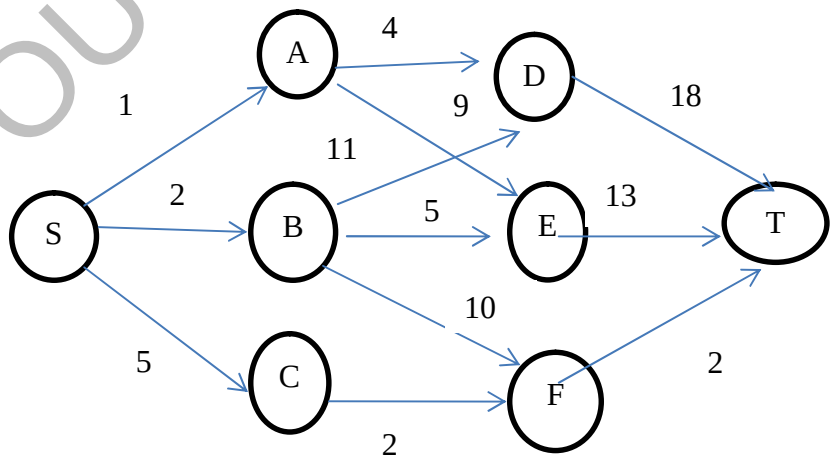

Figure-1

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15 a) Define NP-Hard and NP-Completer problem 3
b) Explain the relationship between NP-Hard and NP-complete. 2
c) Explain Job-Shop Scheduling problem with example. 5

16 a) Explain about Strassen's matrix multiplication and list the Strassen's formula. 6
b) Multiply the two matrices using Strassen's formula. 4

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \times \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

17 a) Sort the following elements using quick sort. 5

65, 70, 75, 80, 85, 60, 55, 50, 45

b) Write an algorithm for Depth First Graph Traversal with example. 5

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Code No. 11428/CBCS

FACULTY OF ENGINEERING

B.E. (Civil) IV - Semester (CBCS) (Main & Backlog) Examination, May/June 2019

Subject : Strength of Materials - II

Time : 3 Hours **Max. Marks: 70**

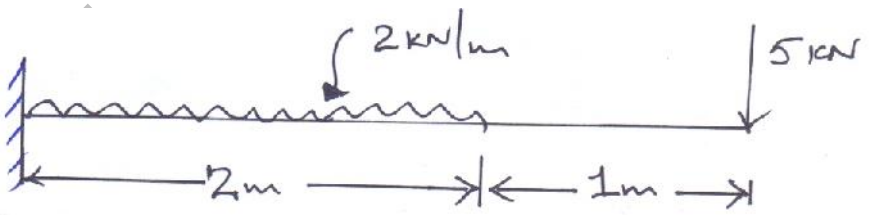
Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (20 Marks)

1 State Mohr's second theorem for moment area method.
2 Define a Conjugate Beam?. When do we prefer Conjugate Beam method over other methods?
3 Define RESILIENCE?
4 State Castigliano's first theorem.
5 A circular shaft of 120mm diameter is subjected to a bending moment of 40kNm and a twisting moment of 30kN. Calculate the principal stresses.
6 A closed coil helical spring is required to carry a load of 150N. If the mean coil diameter is to be 8 times that of the wire, calculate these diameters. Take maximum shear stress as $100N/mm^2$.
7 List any 3 assumptions in Euler's theory of columns.
8 A fixed beam AB of 5m span carries a udl of 4kN/m over the entire span. Determine the fixed end moments.
9 Distinguish between static & kinematic indeterminacy.
10 The ratio of stiffness of a member when the far end is hinged to that of a member when the far end is fixed is _____.

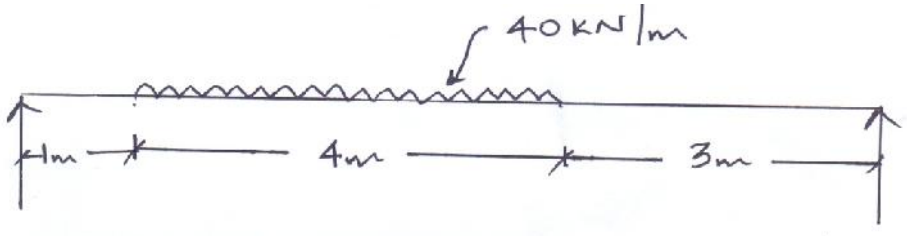
PART – B (50 Marks)

11 a) A cantilever beam 100mm wide and 200mm deep having a span of 3m is subjected to the loads as shown in fig. Find the deflection at the free end. Take Young's modulus as $2 \times 10^5 N/mm^2$. (5)



b) Find the deflection of a cantilever beam of length 'l' and subjected to a uniformly varying load (uvl) with zero at free end and W N/m at the fixed end. (5)

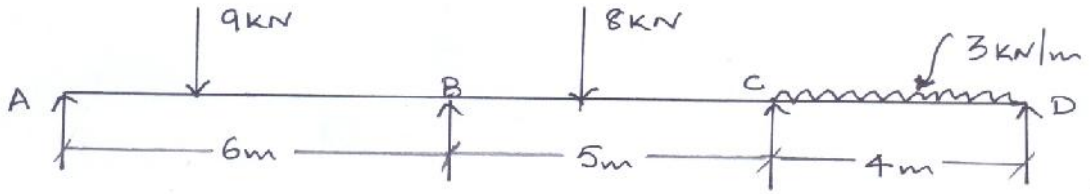
12 A beam of length 8m is simply supported at the ends. It carries a udl of 40kN/m as shown in fig. Determine the deflection of the beam at its mid point. Also find the maximum deflection. Take $E = 2 \times 10^5 N/mm^2$ and $I = 4.3 \times 10^8 mm^4$. (10)



13 a) A cantilever beam of span 3m is provided with a prop at free end and is carrying a udl of intensity 3KN/m over a length of 2m from the fixed end. Draw SFD & BMD. (5)

b) A fixed beam of length 6m carries two point loads of 30kN each at a distance of 2m from both ends. Determine the fixed end moments and draw the BMD. (5)

14 A continuous beam ABCD is simply supported at A,B, C & D is loaded as shown in fig. Find the moments over the beam and draw S.F and B.M. diagrams. (10)



15 a) Find the maximum torque that can be safely applied to a shaft of 80mm diameter. The permissible angle of twist is 1.5 degree in a length of 5m & shear stress is not to exceed 42MPa. Take Shear modulus = 84 GPa. (5)

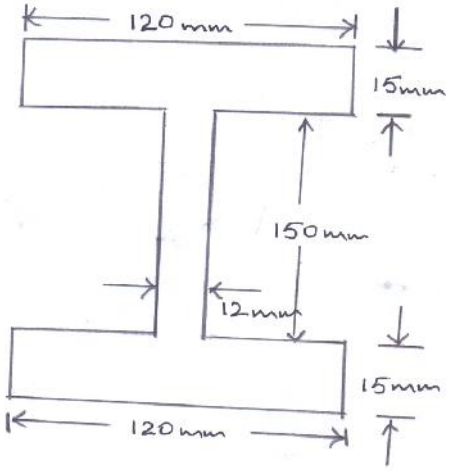
b) A closely coiled helical spring made of 10mm diameter steel wire has 15 coils of 100mm mean diameter. The spring is subjected to an axial load of 100N. Calculate the maximum shear stress induced and the deflection of the spring. (5)

16 a) Calculate the strain energy in a bar 3m long & 40mm in diameter when it is subjected to a tensile load of 100kN, if the load is applied (i) Gradually (ii) Suddenly. (5)

b) A load of 100N falls through a height of 2cm onto a collar rigidly attached to the lower end of a vertical bar 1.5m long and of 1.5cm^2 cross sectional area. The upper end of the bar is fixed. Determine the maximum instantaneous elongation. (5)

17 A steel column is in the shape of an I-Section at its base as shown in fig. Estimate the load carrying capacity of the column by Euler's theory if length of the column is 4m, when:

(i) both ends are hinged.
(ii) both ends are fixed.
(iii) one end is fixed and other end is free.



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Code No: 11438/CBCS

FACULTY OF ENGINEERING

B.E IV-Semester (CBCS) (EE/Inst.) (Main & Backlog) Examination, May/June 2019

Subject: Power Electronics

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part-A, & Answer any five questions from Part-B

1	Define the following terms for diodes: i) Softness factor ii) Peak Inverse Voltage	2
2	Why is it preferable to use hard drive for BJT?	2
3	What is meant by over driving of SCR and why it is required?	2
4	In R triggering circuit why the firing angle is limited to 90^0.	2
5	For a mid-point converter, why the PIV is twice of the supply voltage across the device?	2
6	What do you understand by the term "line commutated inverter"?	
7	List the disadvantages of frequency modulation scheme.	2
8	List industrial applications of cycloconverter.	2
9	Explain the difference between line commutated and forced commutated inverters.	2
10	A single phase bridge inverter is fed from a dc source such that fundamental component of output voltage is 230V. Find the fundamental component of load current for the following load details: R=2Ω, X_L=8Ω and X_C=6Ω	2

PART-B (50 Marks)

11	a) Describe the switching characteristics of power MOSFET.	5
	b) Describe the different modes of operation of a thyristor with the help of its static V-I characteristics.	5
12	a) Draw a circuit diagram illustrating the protection of both anode and gate circuits of an SCR. Describe briefly the function of various components used.	5
	b) Explain with relevant circuit diagram and waveforms how complementary impulse commutation is achieved?	5
13	a) An RL load, energized from single phase, 230V, 50Hz source through a single thyristor, has R=10Ω and L=0.08H. If thyristor is triggered in every positive half cycle at $\alpha=75^0$, find current expression as a function of time.	5
	b) For a three phase semi converter, draw output voltage waveforms for a firing angle delay of 45^0 and obtain an expression for the output voltage.	5
14	a) Draw the power circuit diagram for a type-A chopper. Show load voltage waveforms for i)α=0.3 and ii)α=0.8. For both these duty cycles, find the average and rms values of output voltage in terms of source voltage V_s.	5
	b) Describe the operating principle of 1-phase to 1-phase step-up cycloconverter with the help of bridge configuration.	5
15	A star connected load of 15Ω per phase is fed from 420V dc source through a 3-phase bridge inverter. For both a)180^0 mode and a)120^0 mode, determine i. rms value of load current ii. rms value of thyristor current iii. load power	10

..2

16 A single-phase semi converter delivers power to RLE load with R=5Ω, L=10mH and E=80V. the ac source voltage is 230V, 50Hz. For a continuous conduction, find the average value of output current for a firing angle delay of 50^0.
If main SCR T_2 is damaged and open circuited, find the new value of average output current. Sketch the output voltage waveform and indicate the conduction of various components. (10)

17 Explain any two from the following: (10)
a) Explain the various methods employed for the control of output voltage of inverters.
b) Two Transistor Analogy of SCR.
c) 180^0 mode of operation for 3-phase inverters.

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Code No: 11444/CBCS

FACULTY OF ENGINEERING

BE IV Semester (CBCS) (ECE) (Main & Backlog) Examination, May / June 2019

Subject: Analog Electronic Circuits

Time: 3Hoursr **Max.Marks:70**

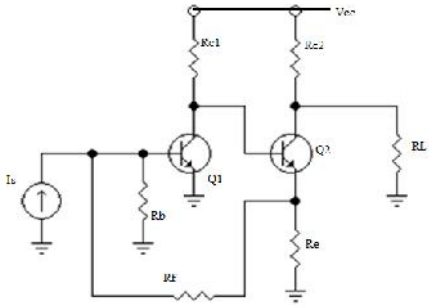
Note: Answer All Questions From Part – A & Any five questions from Part – B.

Part – A (20 Marks)

1. Define Gain Bandwidth Product? 2M
2. State the Advantages of Class B amplifier over Class A amplifier? 2M
3. Write Barkhausen Criterion for Oscillators? 2M
4. Compare Series and Shunt Voltage regulators? 2M
5. A single tuned direct coupled amplifier having Rc= 100 KΩ, fo= 1MHz, L=500mH, Q=50, gm = 1.5 mA/V. Find gain, bandwidth? 2M
6. Draw and explain the block diagram of feedback amplifier? 2M
7. Distinguish single tuned amplifiers and double tuned amplifiers? 2M
8. What is frequency stability criterion of an oscillator? Which parameter is used to Quantify the frequency stability? 2M
9. Discuss about the mid frequency response of FET amplifier? 2M
10. Differentiate Voltage and Power amplifiers? 2M

Part – B (50 Marks)

11. a) A three stage BJT amplifier with identical stages has an overall lower and upper 3db Cut-off frequencies of 10Hz and 10 KHz, respectively. Determine the upper and lower Cutoff frequencies of the individual stages assuming that the stages are Identical? 6M
    b) Sketch the frequency response of a transformer coupled BJT amplifier. State its Advantages over RC coupled BJT amplifier? 4M
12. Prove that the circuit given below is current shunt feedback amplifier. Derive the Expression for feedback factor β, Current gain (A_{if}), Input Resistance (R_{if}), Out putresistance (R_{of})? 10M



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13. a) With the help of relevant circuit diagram, briefly explain the operation of RC phase shift oscillator using BJT and derive its frequency of oscillations? 7M

b) A quartz crystal is characterized by L=2.5H, Cs=0.01pf, C_M=10pf. Determine the series and parallel resonant frequencies of the crystal? 3M

14. a) Draw the circuit diagram for class A amplifier. Explain it operation? 5M

b) For class 'B' amplifier providing 22 V peak signal to 8Ω load and power supply Vcc =25 V. Determine: (i) Input power (ii) Output power (iii) Circuit efficiency? 5M

15. a) For a power amplifier with D_2 = 0.1,D_3=0.05,D_4 = 0.02 and I_1=2A ,R_L = 15Ω Find (i) Total harmonic distortion (ii) Fundamental power? 6M

b) An amplifier has voltage gain of 4000.Its R_i = 2K ohms and R_o=60 ohms. Calculate A_{Vf}, R_{if}, R_{of}. β is 5% of the output in series voltage feedback amplifier? 4M

16. Draw the circuit of Push pull 'C' power amplifier. Explain it operation and derive the expression for output power and collector circuit efficient? 10M

17. Write a short note on 10M

(a) Local and Global feedback.
(b) Staggered tuned amplifier.
(c) π model for high frequencies.

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Code No : 11448/CBCS

FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) (M/P) (Main & Backlog) Examination, May / June 2019

Subject: Electrical Circuits and Machines

Time : 3 Hours **Max Marks :70**

Note: Answer all questions from Part-A & Any five questions from Part-B.

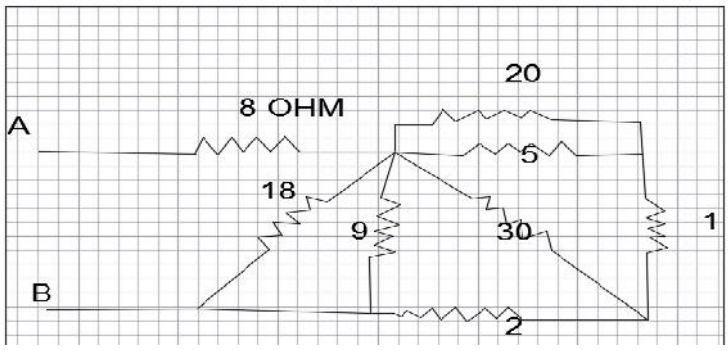
Part - A (20 Marks)

1. Give the significance of back emf in a DC motor. 2
2. Define voltage regulation of transformer 2
3. Define i) maximum value, ii) average value iii) form factor of alternating quantity 2
4. Derive the expression for energy stored in an inductor 2
5. Give the expression for torque developed by three phase induction motor 2
6. What is universal motor 2
7. What is function of commutator in a DC machine? 2
8. Mention various losses in a transformer 2
9. What do you understand by balanced three phase circuits 2
10. What is necessity of starter in machines 2

Part - B (50 MARKS)

11. a) Explain Kirchhoff's laws in detail with an example 5

    b) Find Rab for the given circuit (Given values are in ohms) 5



12. a) Derive an expression for the electromagnetic torque produced by dc motor 5
    b) A 6-pole DC shunt generator with lap connected armature supplies a load of 100 A at 200 V. The armature resistance 0.1ohms, and shunt field resistance is 80 0hms find the i) total armature current ii) EMF generated. 5

13. a) Explain how the rotating magnetic field is developed in a three phase induction motor 5

    b) Three phase induction motor is wound for 6-poles and is supplied a 50 Hz supply calculate i) synchronous speed ii) the rotor frequency when the speed of the rotor is 900 rpm. 5

…2

14. a) Explain measurement of power of three phase circuit by using two wattmeter method. 5
    b) Explain the principle of operation of DC machine. 5

15. Explain with a neat diagram OC and SC test on a single phase transformer. Explain how you can draw the equivalent circuit with the help of the above tests. 10

16. Write a short notes on the following
    i) capacitor run motor 4

    ii) auto transformer 3

    iii) losses in a DC machine. 3

17. a) Derive expression for effective value and average value of alternating quantity 5

    b) Explain about mutual induction. 5

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Code No. 11454/CBCS

FACULTY OF ENGINEERING

B. E. IV – Semester (CBCS) (A.E) (Main & Backlog) Examination, May/June 2019

Subject: Automotive Petrol Engines

Time : 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part – A & any five questions from Part – B.

PART – A (2 x 10 = 20 Marks)

1. What is compression ratio? Define and write the operating range for petrol engine.
2. Draw the valve timing diagram for 4-stroke petrol engine.
3. Explain the significance of firing order.
4. Draw a neat sketch of simple Carburetor.
5. What is MPFI?
6. What are the requirements of spark plug?
7. Define flame front propagation.
8. What is petrol injection?
9. Explain the various reason for cooling an I. C. engine.
10. What is the need of Lubrication system?

PART – B (10 x 5 = 50 Marks)

11. a) Differentiate between 4-stroke and 2-stroke engine operations?
    b) What are the methods by which volumetric efficiency can be improved? Explain in detail.

12. With a neat sketch explain the construction and operations of solex carburetor.

13. What are constant choke and constant vacuum carburetors? Explain with suitable sketches.

14. a) With a suitable sketch explain Magneto ignition system.
    b) Differentiate between centrifugal advance Mechanism and Vaccum advance Mechanism.

15. What is meant by abnormal combustion? Explain the phenomena of knock in S.I engine and on what parameters it depends?

16. a) With a neat sketch explain the working principle of thermo siphon cooling system.
    b) Differentiate between wet sump and dry sump lubrication systems.

17. Write short notes on the followings
    a) Otto cycle. Its efficiency –Derivator
    b) Electronic ignition System.
    b) Types of combustion chamber.

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Code No: 111458/CBCS

FACULTY OF ENGINEERING

BE IV - Semester (CBCS)(CSE) (Main & Backlog) Examination, May /June 2019

Subject : Signals and System Analysis

Time: 3 Hours **Max Marks: 70**

Note: Answer all questions from Part-A & Any five questions From Part-B.

Part - A (20 Marks)

1. Express signum function in terms of unit step function 2
2. Show that the signals x(t) = $\begin{cases} -1, \ for\ 0 < t < 2 \\ 1, \text{for } 2 < t < 4 \end{cases}$, y(t)= $\begin{cases} -1, \text{for } 0 < t < 2 \\ 1, \text{for } 1 < t < 3 \\ -1, \text{for } 3 < t < 4 \end{cases}$ are orthogonal

   Over an interval [0,4] 2
3. State and prove frequency shifting property of Fourier transform 2
4. Find Fourier transform of single sided exponential signal 2
5. Explain impulse response of an LTI system 2
6. Define the bandwidth of a system 2
7. Show that the auto correlation function at the origin is equal to the energy of the signal 2
8. Give the relation between convolution and correlation 2
9. Write the advantages of Z-Transform 2
10. Find the Z-transform of unit impulse 2

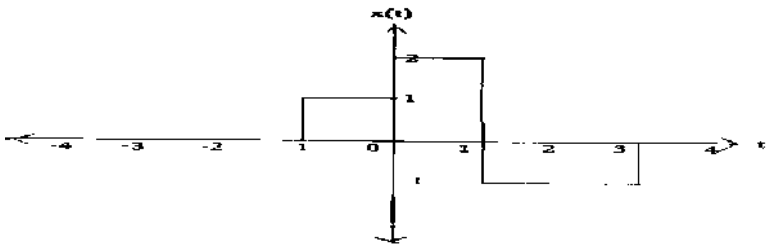
PART – B (50 Marks)

11. a) Derive the expression for approximation of two signals $x_1(t)$ and $x_2(t)$ such that mean square error is minimum. 4

    b) Approximate rectangular function x(t)= $\begin{cases} A, \text{for } 0 < t < \frac{®}{2} \\ -A, \text{for } \frac{®}{2} < t < \frac{3®}{2} \\ A, \text{for } \frac{3®}{2} < t < 2® \end{cases}$ by Acos(t) in the interval

    [0.2®] such that the mean square error is minimum 6

12. a) Derive Fourier Transform from Fourier series 5
    b) Find Fourier Transform of x(t) shown in figure bellow 5



13. a) Derive the relation between Bandwidth and Rise time 7
    b) Show that system y(t)=x(t) + x(t-2) is linear time invariant system 3

14. a) State and prove time convolution theorem and frequency convolution theorem 7
    b) Find the convolution of $x1(t) = e^{-at}\, u(t)$, $x2(t)=e^{-bt}\, u(t)$ using Fourier transform 3

15. a) Compare between Laplace, Fourier and Z-Transforms 5
    b) Find the Z-Transform and ROC of $x(n) = \left(\frac{1}{4}\right)^n \cos\left(\frac{®}{3}n\right) u(n)$ 5

16. a) Explain about orthogonality in complex functions 5
    b) Find the Fourier Transform of rectangular pulse using time differentiation property 5

17. Write about the following:
    a) Transfer function of an LTI system 3
    b) Energy Density Spectrum 4
    c) Advantages and limitations of Z-transform 3

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Code No. 11464/CBCS

FACULTY OF ENGINEERING

B.E IV–Semester (I.T) (CBCS) (Main & Backlog) Examination, May/June 2019

Subject : Computer Organization and Micro processor

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part-A and Any five questions from Part-B**.**

PART – A (20 Marks)

1. Write about DMA
2. Explain instructions XRA A and CMP B.
3. Write primary feature of 8259A
4. Explain function of ALE
5. Write about DRAM
6. Write about stacks
7. Explain serial bus of RS 232C
8. Write about DAC
9. Define baud rate? How does it affect data transmission?
10. Write Assembly language program to perform subtraction of two 8-bit number without using SUB/SBB/SUI instruction.

PART – B (50 Marks)

11. a. Discuss Historical perspective of computer 7M
    b. Differentiate between multiprocessor and multicomputer 3M
12. Explain in detail organization of 1K memory cell with neat diagram 10M
13. Discuss Addressing modes of 8085 in detail 10M
14. a. Differentiate microprocessor and micro controller 3M
    b. Explain functional units of computer 7M
15. Write in detail about Analog to Digital converters 10M
16. Explain in detail working of Interval timer(Intel 8253 /8254) 10M
17. Discuss Programmable communication interface (Intel 8251) 10M

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