Code No.2045/BL

FACULTY OF ENGINEERING

B. E. 2/4 (Civil) II – Semester (Backlog) Examination, October 2020

Subject: Strength of Materials - II

Time: 2 hours **Max. Marks: 75**

PART – A

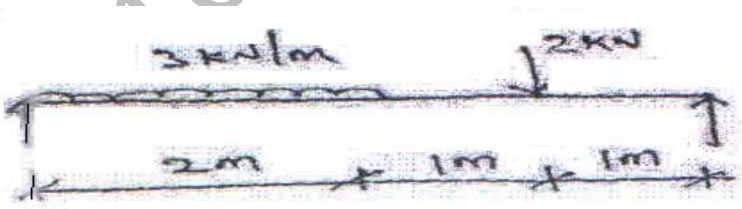
Note: Answer any seven questions. **(7x3 = 21 Marks)**

1. State Mohr's first and second theorem.
2. A cantilever beam of 6m is subjected to UDL of 10 kN/m throughout the span. Find maximum slope and deflection.
3. What is the difference between elastic & rigid props?
4. What is Static indeterminacy?
5. State and explain theorem of 3 moments.
6. What is shear flow? Explain briefly.
7. Write the formula for finding deflection in a closely coiled helical spring subjected to an axial load. 2
8. Explain Reciprocal theorem.
9. What are the merits of tension co-efficient method?
10. What are the limitations of Euler's Column theory?

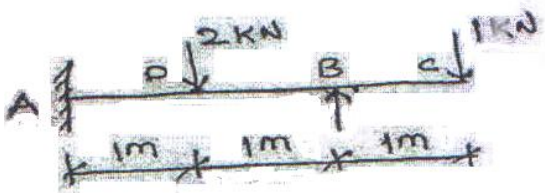
PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11. Find the max deflection of the given beam by using Macaulay's method.



12. Draw SFD and BMD for propped cantilever beam shown in the figure.



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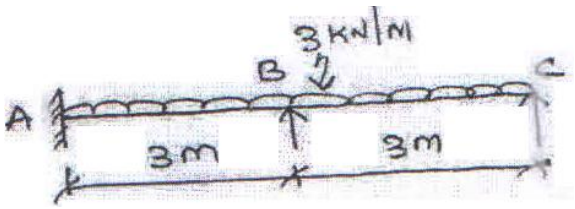
13. Draw shear force and bending moment diagram for the below shown in the figure.



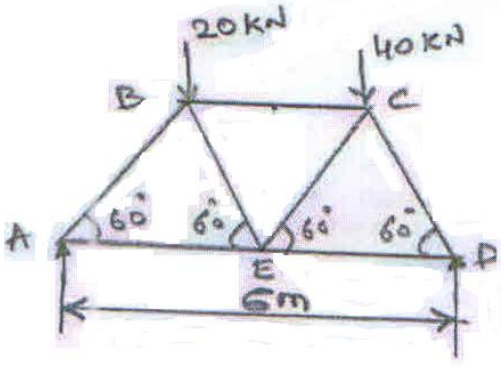
14. (a) A hollow cast iron column 5m long is fixed at both ends and has an external diameter of 300mm. The column supports an axial load of 1200kN. Find the internal diameter of the column, adopting a factor of safety of 5. Take f_c = 550 N/mm^2 and α = 1/1600.

15. (a) Explain Castigliano's Theorem.

    (b) A simply supported beam carried a point load P eccentrically on the span I, find the deflection under the load. Assume uniform flexural rigidity.

16. A hollow C.I. column whose outside diameter is 200 mm has a thickness of 20 mm, it is 4.5 meters long and is fixed at both ends. Calculate the safe lkoad by Rankine's formula using a factor of safety of 4. Calculate the slenderness ratio and the ratio of Euler's and Rankine's critical loads. For cast iron take F_C = 500 N/mm^2 and α = 1/1600 E = 8 x 10^4 N/mm^2.

17. Find forces in members of the Truss shown.



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Code No: 2051/BL

FACULTY OF ENGINEERING

B.E. II/IV (EEE) II-Semester (Backlog) Examination, October 2020

Subject: Electrical Circuits – II

Time: 2 Hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1. An exponential voltage V(t) = $16e^{-4t}$ volts is applied to series RL circuit with R = 1Ω and L= 0.2H. Find the response i(t) assuming initial charge to be zero.
2. Obtain the ramp response of a series RC circuit.
3. Using the initial and final value theorems where they apply, find f(0^+) and f(∞) for the flowing function $F(S) = \frac{(S+2)}{(S+5)(S+4)}$.
4. Find the Laplace transform of t cos at.
5. Determine the admittance parameters of the Two Port network shown in Fig.1.

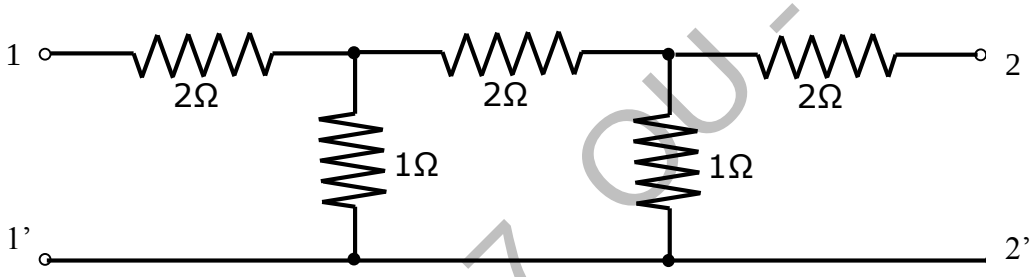
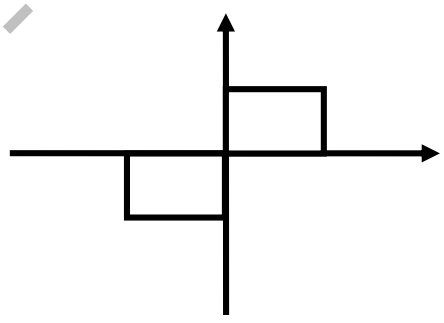


Fig.1

6. Express T-parameters in terms of h-parameters.
7. Obtain even and odd pats of the given function shown in Fig.2 and plot these two.



8. Define odd function symmetry in Fourier series.
9. Verify whether the given polynomial is Hurwitz or not.

$P(s) = 4s^6 + 2s^5 + 12s^4 + 10s^3 + 3s^2 + 5s + 25$

10. List the properties of Positive-Real function.

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PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11. Derive the expression for transient response in RL series circuit excited by a DC source. Find the time constant and maximum value of stored energy with R = 10Ω and L= 20mH for a series RL circuit excited by a 200V DC supply.
12. A ramp voltage 3 (t-5) is applied for a series RL circuit at t = 0 where R = 5Ω and L = 2H. Assuming zero initial conditions, Find i(t).
13. Determine the transmission and hybrid parameters for the network shown in Fig. 3.

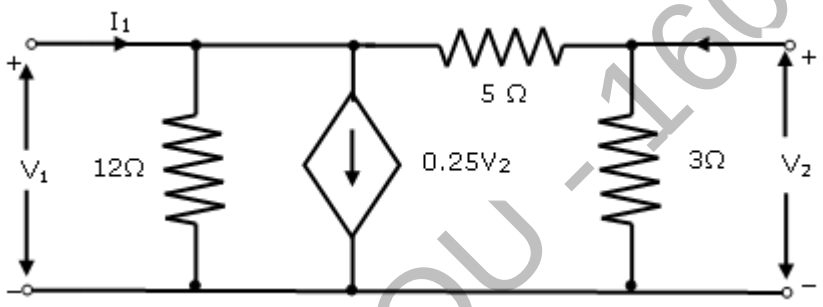

Fig.3

14. The Fourier transform of a continuous signal f(t) is given by $F(w) = \frac{10}{j\omega+4}$. Determine the Fourier transform Y(w) if Y(t) = f(t) cos2t.
15. The driving point impedance of an LC network is given by $Z(s) = \frac{10(s^2+4)(s^2+16)}{s\,(s^2+9)}$. Obtain the first form of Foster network.
16. Find the exponential Fourier series for a waveform shown in Fig.4 and sketch its frequency spectrum.

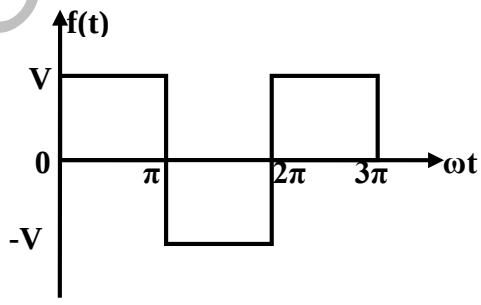

Fig.4

17. Realize $Z(s) = \frac{s(s^2+2)(s^2+4)}{(s^2+1)(s^2+3)(s^2+5)}$ in Caner First and Second form.

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Code No. 2057/BL

FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) II – Semester (Backlog) Examination, October 2020

Subject : Transducer Engineering

Time : 2 hours **Max. Marks : 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1. Mention the difference between Repeatability and Reproducibility.
2. What are the different standard inputs for studying the dynamic response of a system.
3. List out the basic requirements of transducers.
4. How can a capacitive transducer be used as a proximity transducer?
5. Mention the operating principle of a thermistor with relevant VI characteristics.
6. What is a transduction element? Give examples.
7. How are the transducers classified? Explain each with examples?
8. What is the law of intermediate metals?
9. Mention the characteristics of flat type diaphragms.
10. What is the principle of operation of a capacitive transducers?

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11. Explain any two dynamic features of measurement system?

12. a) List the characteristics of a potentiometer. Explain the loading effect with the help of equations.
    b) List the advantages & dis-advantages of potentiometers.

13. Discuss the principle of operation of LVDT as a displacement transducer and also mention its merits and demerits?

14. a) Explain the laws use to study the behavior of thermocouple?
    b) Explain the constructional detail of an RRD?

15. a) What do you understand by Ionization gauge?
    b) Derive the expression for the deflection of diaphragm of a pressure measurement type transducer.

16. a) Explain the various static characteristics of measuring systems?
    b) Explain the construction and working of a bonded strain gauge?

17. Write short notes on;
    a) Application of strain gauge
    b) Bourdan Tube
    c) RVDT

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Code : 2059/BL

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II-Semester (Backlog) Examinations, October 2020

Subject : Probability Theory and Stochastic Processes

Time : 2 Hours **Max. Marks :75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 State the axioms of the Probability.

2 In an experiment a number N is randomly picked from set of integers 0 to 9.
If A = P (Number, N ≤ 6) B = P (Number, N < 2) Find P(AUB) and P (A ∩ B).

3 Define the characteristic function of a random variable. Explain its application.

4 If Y = 2X and $f_X(x) = \frac{1}{2}\, e^{\frac{-x}{2}} u(x)$. Find the first ordinary moment of Y.

5 Write any three properties of joint distribution function $F_{X,Y}(x, y)$.

6 Define co-variance C_{XY} of two random variables X and Y.

7 Define a Markov Process.

8 Write any two applications of random numbers.

9 State any three properties of Spectral density.

10 Explain Central Limit theorem with respect to random sequences.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 a) Define : i) Conditional probability. ii) Bayes theorem

b) A box contains 40 numbers of 10KΩ resistances with 5% tolerance and 20 numbers of 10KΩ resistors with 10% tolerance. Similarly there are 10 numbers of 20 KΩ resistors with 5% tolerance and 30numbers of 20KΩ resistors with 10% tolerance. A resistor is randomly picked from the box. If the resistor is a 20KΩ one, find the probability that it is of 10% tolerance.

12 a) The probability density function of a Gaussian random variable X is given by

$f_X(x) = \frac{1}{\sqrt{2\,\pi\sigma}}\, e^{\frac{-x^2}{2\sigma^2}}$.

b) Find i) Cumulative distributive function of X ii) Mean of X iii) Variance of X

13 a) Derive an expression for the characteristic function of a uniformly distributed random variable X between 2 and 10.

b) Find the mean and mean square value of the above random variable using characteristic function.

14 a) Write any four properties of joint probability density function.

b) Derive an expression for the probability density function of Z if Z = X + Y where X, Y are independent random variables.

15 a) Discuss the method of generation of random numbers.

b) Explain Linear Mean square estimation.

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16 a) Define a Wide sense stationary random process.

b) A random process $X(t) = A\,Cos(\omega_0 t + \theta)$ where A and ω_0 are constants and θ is a uniformly distributed random variable in the interval (0, 2π). Show that X(t) is Wide sense stationary.

17 Write short notes on the following :

a) Poisson distribution.

b) Joint characteristic functions.

c) Relation between input-output power spectral densities of a Linear system with random inputs.

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Code No. 2065/BL

FACULTY OF ENGINEERING

B.E. 2/4 (M / P / A.E. / CSE) II-Semester (Backlog) Examination, October 2020

Subject : Mathematics – IV

Time : 2 Hours **Max. Marks: 75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Define analytic function and given an example.
2 State Cauchy's theorem.
3 Define conformal mapping and give an example.
4 Find P such that the function f(z) expressed in polar co-ordinates as $f(z) = r^2 \cos 2\theta + ir^2 \sin 2\theta$ is analytic.
5 State convolution theorem in Z – transforms.
6 Find the inverse Z – transform of $\frac{z}{(z+2)(z+3)}$.
7 Define Fourier sine and cosine integrals.
8 Find the finite fourier sine transform of $f(x) = x^2$ in $0 < x < \ell$.
9 Explain Range – Kutta method of order four.
10 Define Lagrange's interpolation.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 (a) Evaluate $\oint_C \frac{e^{-z}}{z+1} dz$ where C is the circle |z| = 2.

(b) Show that the function $u = e^{-2xy} \sin(x^2 - y^2)$ is harmonic. Find the conjugate function.

12 (a) Find Laurent's series expansion of $f(z) = \frac{z^2 - 4}{z^2 + 5z + 4}$ in

(i) | z | < 1 (ii) | < | z | < 4.

(b) Evaluate the integral $I = \int_0^{2\pi} \frac{d\theta}{a + \cos\theta}$, a > 1.

13 (a) Find the inverse z-transform of $F(z) = \frac{z^3 + 2z^2 + 29z}{(z-1)(z+3)^2}$.

(b) Solve the difference equation $y_{n+1} - 5y_n = 0$, using z-transform.

14 (a) Find the Fourier sine transform of $\frac{e^{-ax}}{x}$.

(b) Find the Fourier cosine and sine integral representations of $f(x) = e^{-kx}$, $x \geq 0$ where K is a positive constant.

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15 (a) Perform four iterations of the Newton-Raphson method to find the smallest positive root of the equation f(x) = x^3 - 5x +1 = 0.

(b) Using Newton's divide difference formula, evaluation f(8) and f(15) from the following data:

x	4	5	7	10	11	13
f(x)	48	100	294	900	1210	2028

16 (a) Find the Bilinear transformation which maps 1, i, 0 to 0, 1, ∞ respectively.

(b) Evaluate $\oint_C \frac{e^{2z}}{(z+1)^4} dz$ where C is the circle | z | = 2.

17 (a) Determine the Z-transform of $e^{-\alpha n}$ sin βn.

(b) Given $\frac{dy}{dx} = \frac{y - x}{y + x}$ with y = 1 when x = 0. Find y for x = 0.1 by Euler's method.

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Code No: 2077/BL

FACULTY OF ENGINEERING

B.E. 2/4 (IT) II – Semester (Backlog) Examination, October 2020

Subject: Probability and Random Processes

Time: 2 Hours **Max.Marks:75**

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 If A, B & C are any three events such that P(A) = P(B)=P(C)= 1/4, P(A∩B)=P(B∩C)=0 and P(A∩C)= 1/8. Find the probability that at least one of the events A, B, C occurs.
2 If A & B are independent events, Show that A^c & B^c are also independent events.
3 State the properties of characteristic function of a random variable.
4 If a random variable X is uniformly distributed over (0, 20), Find its mean & variance.
5 Write about Joint Moments of two Random Variables.
6 Write any three properties of Joint Distribution function of two random variables.
7 Define stationarity of a random process.
8 Write any three properties of Autocorrelation.
9 State Wiener-Kintchine theorem.
10 Find PSD of White Noise.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 (a) State and prove Bayes theorem.
(b) For a binary communication channel the probability that a transmitted 0, received as 0 is 0.95. The probability that a transmitted 1, received as 1 is 0.9. If the probability that a 0 is transmitted is 0.4. If 1 is received, Find the probability that 1 was transmitted.

12 The Probability Density Function (pdf) of a continuous random variable X that can take values between X=0 and X=2 is given by f(x) = kx(2-x) Find
i) k ii) Mean
iii) Variance iv) P(X<1) v) P(X>1/2)

13 Two random variables X & Y are jointly distributed over the region 0 < x < y < 1 as

$$f(x,y) = \begin{cases} k\,x\,; & 0 < x < y < 1 \\ 0\,; & otherwise \end{cases}$$

Find i) k ii) Means of X & Y
iii) Variances of X & Y iv) Co-variance of X & Y

14 If X(t) = 5cos(10t + θ) & Y(t) = 20sin(10t + θ) where θ is a uniformly distributed random variable in (0, 2π). Prove that X(t) & Y(t) are jointly stationary in wide sense WSS.

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15 Consider a white Gaussian noise of zero mean and power spectral density No/2 applied to a low-pass RC filter whose transfer function is given below. Find the auto-correlation function of the output random process.

$H(f) = \frac{1}{1+i2\pi fRC}$

16 (a) Explain about conditional probability.
(b) Derive the expressions for mean & variance of binomial random variable.

17 For the joint probability distribution of two discrete random variables X & Y is given below. Find
i) Marginal distributions of X & Y
ii) Conditional Mean of X given the value of Y=1
iii) P(X< 2, Y< 2)
iv) P(X+Y< 4)
v) P(X< 2/Y< 2)

X\Y	1	2	3
1	4/36	3/36	2/36
2	3/36	7/36	5/36
3	5/36	2/36	5/36

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Code No.2557/CBCS/BL

FACULTY OF ENGINEERING

B.E. (Civil) IV-Semester (CBCS) (Backlog) Examination, October 2020

Subject : Strength of Materials-II

Time : 2 hours **Max. Marks : 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 What is conjugate beam? Explain how the deflection of a beam is determined using conjugate beam.
2 Using Double Integration method, find the deflection of a cantilever beam at its mid-point if it is loaded with a uniformly distributed load of intensity 'w' over entire span 'ℓ'.
3 A propped cantilever of span 5 m is loaded with concentrated load of 50 kN at 3 m from propped end. Find the prop reaction.
4 Write the equation of theorem of three moments for a two span continuous beam with one of the exterior end is fixed and other as simply supported.
5 A close coiled helical spring of mean diameter 120mm, diameter of coil 8mm is subjected to an axial load of 300 N. Determine the maximum deflection of the spring, if the number of turns are 10 in the spring.
6 Define the terms equivalent bending moment and equivalent twisting moment.
7 Write the expression for deflection of a statically determinate bar subjected to a suddenly applied load and shock load.
8 State and explain reciprocal theorem.
9 Define stiffness and carry over factors.
10 Differentiate between Euler's theory and Rankine's theory of crippling load.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 Using Moment area method, find the deflection of point 'D' of the beam shown in fig.(1).

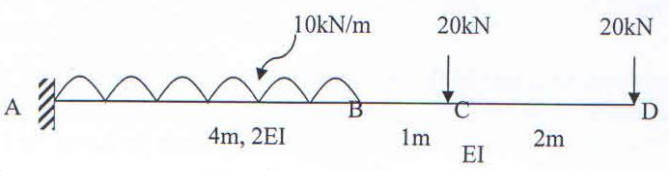

fig.(1)

12 Analyse the fixed beam shown in fig.(2) and draw the S.F and B.M diagrams.

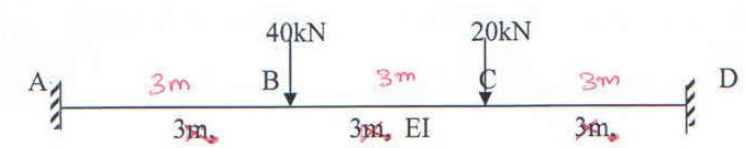

fig.(2)

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13 Analyse the continuous beam shown in fig.(3) by theorem of three moments and draw its B.M.D.

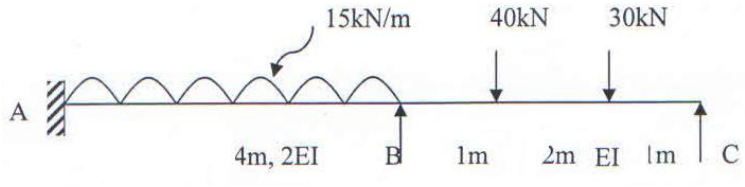

fig.(3)

14 a) Develop the expression for the deflection of closely coiled helical spring subjected to an axial load 'W' at its free end.

b) A hallow circular shaft of internal diameter as 0.75 times that of external diameter is subjected to a twisting moment of 40 kN m and a bending moment of 80 kN m. If the maximum shear stress not to exceed 90 N/mm^2, find the outer diameter of the shaft.

15 a) Define the terms static indeterminacy and kinematic indeterminacy by taking suitable examples.

b) A weight of 1000 N falls through a height of 600 mm on a collar of a suspended hollow steel bar of external diameter 75 mm and internal diameter 50 mm. The length of the bars is 4 m. Determine the stress induced in the bar and also find the maximum deformation. Take E = 200 GPa.

16 Using column analogy method find the fixed end moments for a fixed beam of span 7 m, loaded with udl of intensity 20 kN/m over entire span. The moment of inertia of left half of the beam is two times that of the right half.

17 a) Derive the Euler's Equation for the buckling load of slender column whose both ends are fixed.

b) Using Euler's equation of crippling load, find the load carrying capacity of a hollow circular column of external diameter 200 mm, internal diameter 150 mm, 5 m long and fixed at both ends. Take E = 2.1 x 10^5 N/mm^2.

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Code No.2564/CBCS/BL

FACULTY OF ENGINEERING

B. E. (EE/Inst.) (CBCS) IV – Semester (Backlog) Examination, October 2020

Subject: Power Electronics

Time: 2 hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. List the disadvantages of Power Converters.
2. Discuss latch-up in IGBT.
3. Why should the available reverse bias time be greater than the turn-off time of a thyristor?
4. Distinguish line commutation and forced commutation.
5. Derive average load voltage expression when 1-ϕ fully controlled bridge rectifier is supplied from a 1- ϕ 230 V ac square-wave supply.
6. Sketch 1-ϕ full-converter waveforms when operated in line commutated inverter mode for RL-load.
7. Sketch the two quadrant chopper with neat circuit diagram.
8. List the applications of Cyclo-converters.
9. State the necessity of feedback diodes in inverters.
10. List the advantages of Multi-level inverters.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. (a) Draw and explain the switching characteristics of power IGBT.
    (b) Explain reverse recovery characteristics of a power diode, and derive expression for Q_{RR}.

12. (a) Discuss about isolated and non-isolated driver circuits for MOSFET.
    (b) Discuss about protection circuits of SCR and deduce related the expressions.

13. (a) A single-phase fully controlled bridge rectifier is supplied at 230 V rms and at a frequency of 50Hz. The source inductance L_s = 5 mH and the load current on the DC side is constant at 12A. Calculate (a) fringe angle (b) overlap angle.
    (b) Write about control strategies of choppers with relevant diagrams.

14. (a) A 1-ϕ full controlled bridge rectifier is supplied from a 230 V ac source with a load resistance of 10 ohms. If the firing angle is 30^0 find (i) the average load voltage (ii) the average load current (iii) RMS load current and (iv) power supplied to the load.
    (b) Derive voltage gain expression for Boost chopper.

…..2

15. (a) Sketch input voltage, input current for a 1-ϕ ac controller supplying R-L load for α<ϕ *where* $\phi = \tan^{-1}\left(\frac{\omega L}{R}\right)$.

    (b) Explain the working of 1-ϕ to 1-ϕ step-down cyclo-converter and draw relevant waveforms. Assume inductive load, continuous conduction and load voltage frequency as $f_s/2$.

16. (a) Explain 180^0 conduction mode of 3-phase bridge inverter.

    (b) Brief about techniques of Pulse width modulation of Inverters.

17. Write short notes on

    (a) Modes of operation of single-phase dual converter.

    (b) Buck-Boost regulators.

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Code No. 2573 / CBCS / BL

FACULTY OF ENGINEERING

B.E. (ECE) IV – Semester (CBCS) (Backlog) Examination, October 2020

Subject: Analog Electronic Circuits

Time: 2 Hours **Max.Marks: 75**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1 Draw equivalent circuit of FET at high frequency?

2 Explain features of Cascode connection and Darlington pair?

3 An amplifier with Z_i = 1KΩ has a voltage gain 1000. If a negative feedback of 0.01 is applied in series mixing, find the input impedance and gain of feedback amplifier?

4 What type of negative feedback exists in emitter follower amplifier? Justify your answer?

5 A RC phase shift oscillator circuit uses R=15K Ω, C = 0.008μF as feedback elements. Determine the frequency of oscillations?

6 Compare LC and RC oscillators?

7 Define neutralization of RF voltage amplifier

8 Sketch the frequency response of a Stagger tuned amplifier?

9 Draw output waveforms for class A, B and C Power amplifiers?

10 In class A power amplifier $V_{CE\ max}$ = 25V, $V_{CE\ min}$ = 5 V. Find overall efficiency for Series fed and Transformer coupled?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

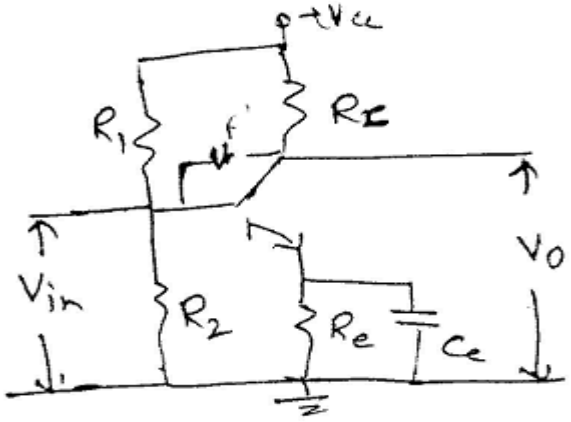
11 a) What is meant by coupling in multistage amplifier? List the types of coupling? Differentiate all types of coupling with their advantages and disadvantages of multistage amplifiers.

b) Define unity gain frequency? Give the relation between unity gain frequency and bandwidth?

..2

12 a) Draw block diagram of Feedback amplifier and explain each block?

b) The Voltage shunt feedback amplifier has the following parameters: R_1 = 20KΩ, R_2 =2KΩ, R_L = 1KΩ, R_c = 4.7KΩ, h_{ie} = 2KΩ, Re =100Ω, R'=10K Ω ,h_{fe} = 80. Calculate A, β, R_{if}, A_f, and Ro_f ?



(6)

13 a) Draw the circuit diagram of a transistorized Colpitts Oscillator and explain its operation? Derive the expression for its frequency of operation minimum gain for sustained oscillations?

b) A Colpitts is designed with C_1 = 200 pF and C_2 = 6500pF. The inductance is variable. Find the range of inductance values if the frequency of oscillator is to vary between 800KHz to 1800KHz.

14 a) Explain the operation of Synchronously tuned amplifier and find an expression for its voltage gain and bandwidth?

b) What are the advantages of double tuned amplifier over single tuned amplifier?

15 a) Derive the collector efficiency and power dissipation of Complementary Symmetry push pull power amplifier with circuit diagram?

b) Justify that Class A power amplifier is cooler in the presence of signal than in the absence of signal?

16 a) List the advantages and disadvantages of Feedback amplifiers and prove any two of them?

b) Describe the operation of Crystal Oscillator?

17 a) Derive the efficiency and power dissipation of Class B push pull power amplifier with neat circuit diagram?

b) Gain and bandwidth of an amplifier are 40dB and 200 KHz. Three such stages are cascaded then find overall gain and bandwidth?

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Code. No. 2577/CBCS/BL

FACULTY OF ENGINEERING

B.E. (M/P) (CBCS) IV-Semester (Backlog) Examination, October 2020

Subject : Electrical Circuits and Machines

Time: 2 Hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

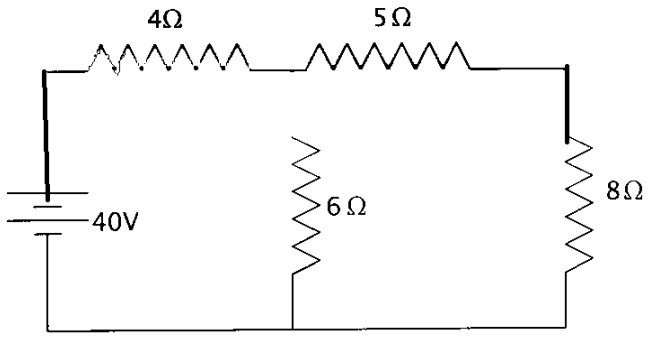
1. State Ohm's law? What are the conditions for ohm's law?
2. Two Resistors of 4Ω and 6Ω are connected in parallel, if the total current is 30A. Solve the current through each resistor?
3. What are advantages of using 3-phase system over single-phase system?
4. Describe a brief note on delta – connected system?
5. Classify different types of DC Generator
6. Why Starters are used in DC Motor?
7. State the methods of starting Induction Motor?
8. A-3 phase Induction Motor running at 1440 r.p.m with 4-pole 50Hz. Solve
   a) Synchronous speed b) Slip
9. List the applications of single phase motors?
10. Explain the principle of alternator?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. a) State and Explain Thevenin's Theorem
    b) Using Thevenin's Theorem. Solve the current in 8Ω resistor in the circuit shown below

6



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12. Discuss about Open Circuit (O.C) and Short Circuit (S.C) Test in the Transformers

13. Describe the construction and working principle of DC Generator with neat circuit diagram?

14. a) Explain the construction and principle of 3-phase Induction motor?
    b) Why 3-phase Induction motor is self-starting?

15. Explain working of capacitor-start, capacitor run Induction motor and universal Motor?

…2

16. a) A resistance of 5Ω is connected in series with a pure inductance of 0.01H to a 100V, 50Hz supply. Solve a) Impedance b) current c) Power absorbed d) inductive reactance (X_L)
    b) Solve the efficiency at full- load and half – load at 0.8 p.f. lagging for a 50KVA transformer having iron loss as 500W and full – load copper losses as 800W.

17. Describe about the following
    a) Three – point starter
    b) Auto Transformer Starter
    c) Advantages of Stationary Armature in Alternator

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Code No. 2583/CBCS/BL

FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) (A.E) (Backlog) Examination, October 2020

Subject : Automotive Petrol Engines

Time: 2 Hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. What are the advantages of 4 stroke engines over 2 stroke engines?
2. Define volumetric efficiency
3. Explain why rich mixture is required during starting of vehicle.
4. List the advantages of petrol injection system.
5. What is the requirement of good spark plug.
6. Define battery capacity and battery voltage.
7. Draw a neat sketch of stages of combustion
8. What are the parameters considered for good combustion chamber?
9. What are anti freezing compounds?
10. What are the applications of air – cooling system?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. a) Derive an expression. for air standard efficiency of Otto cycle.
    b) What are the deviations of actual cycles from air standard cycles?

12. a) With a neat sketch explain the working principle of S.U Carburettor.
    b) Draw a neat sketch of mechanical fuel feed pump and explain the working principle.

13. a) Enumerate the advantages of Battery ignition system over magneto ignition system.
    b) Draw the layout of electronic ignition system..

14. a) Differentiate between normal combustion and abnormal combustion.
    b) List the parameters on which the knocking depends and explain it.

15. a) What are the primary and secondary objectives of lubrication system?
    b) Explain the function on thermostat.

16. a) Draw the valve timing diagram and explain its significance.
    b) Explain the need of petrol injection system.

17. a) What is the significance of spark advance mechanism?
    b) Explain the function of radiator in cooling system.

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Code No. 2587/CBCS/BL

FACULTY OF ENGINEERING

B.E. (CSE) IV – Semester (CBCS) (Backlog) Examination, October 2020

Subject: Signals & System Analysis

Time: 2 hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. Show that the signals x(t) = 2, y(t) = $\sqrt{3}$(1-2t) are orthogonal over an interval[0, 1].
2. Define impulse signal and state its properties.
3. Find the Fourier Transform of signum function.
4. State Dirichlet's conditions for Fourier transform.
5. Check whether the system y(t) = x(t/2) is LTI system or not.
6. Define the bandwidth of a signal.
7. State and prove convolution property of Fourier transform.
8. Find the convolution of $x_1(t) = e^{-at}u(t)$, $x_2(t) = e^{-bt}u(t)$ using Fourier transform.
9. State initial and final value theorems of Z-Transform.
10. Find the Z transform of x[n] = u[n].

PART – B

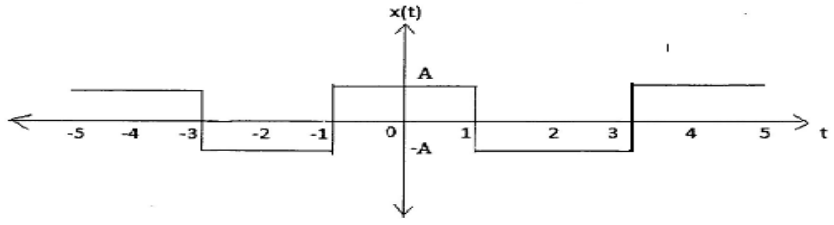
Note: Answer any four questions. **(4x15 = 60 Marks)**

11. (a) Derive the expression for mean square error when a signal is approximated by a set of 'n' mutually orthogonal signals.

    (b) Approximate rectangular function $x(t) = \begin{cases} 1, \text{for } 0 \le t \le \pi \\ -1, \text{for } \pi \le t \le 2\pi \end{cases}$ by a single sinusoid sin(t) over the interval [0, 2π]. Evaluate the mean square error in this approximation.

12. (a) Explain Fourier Transform of periodic signal.

    (b) Find Fourier Transform of the signal shown in the below figure.



13. (a) Explain ideal filter characteristics.

    (b) Determine the impulse response and frequency response of a system which produces an output of $y(t) = e^{-1}u(t)$ for an input of $x(t) = e^{-2t}u(t)$.

…..2

14. Find the convolution of two signals by graphical method

$$x(t) = \begin{cases} 1, \text{for } -3 \le t \le 3 \\ 0, \text{for elsewhere} \end{cases} \quad \text{and} \quad h(t) = \begin{cases} 2, \text{for } 0 \le t \le 3 \\ 0, \text{for elsewhere} \end{cases}$$

15. (a) Distinguish between Laplace, Fourier and Z-Transforms.

    (b) Find the Z-Transform and ROC of $x(n) = \left(\frac{1}{4}\right)^n \cos\left(\frac{\pi}{3}n\right)u(n)$.

16. (a) Explain analogy between vectors and signals.

    (b) Explain about Hilbert Transform.

17. Write about the following:

    (a) Impulse response of a LTI System.

    (b) Energy density spectrum.

    (c) Region of convergence in Z-transform.

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Code No. 2593/CBCS/BL

FACULTY OF ENGINEERING

BE IV Semester (CBCS)(I.T) (Supple.) Examination, October 2020

Subject : Computer Organization & Micro Processor

Time: 2 Hrs **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1) Draw the single Bus Structure, explain its function.

2) Write any two differences between multi computer & multi processor.

3) Define hit, hitrate, miss, misrate.
4) Perform RLC,RAR operation on following data 01110001
5) Write a program to perform 2's complement of a given number.
6) Explain the significance of IO mode operation of 8255.
7) (i) What is the function of stack?
   (ii) Write any two differences between maskable & non maskable interrupts.
8) Draw the timing diagram of 8085 memory read operation.
9) Write the control word of 8255 with mode0 IO operation(port A-i/p ,port B-o/p)
10) Give the significance of DAD instruction with example.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11) Explain the architecture of 8085 with neat sketch in detail.

12) (i) Interpret the operation of USART with RS232C.
    (ii) Write about any three addressing modes of 8085 with example for each.

13) Define DMA. Explain the various channels of DMA controller and its Interfacing.

14) What is the difference between Serial and Parallel Interface? Explain the block diagram of parallel interface with example in detail.

15) (i) Write the significance of Virtual memory.
    (ii) How a performance of device can be enhanced with cache memory?

16) How D/A converter can be interfaced with 8085 microprocesor? Explain with neat sketch.

17) Write short notes on anytwo of the following.
    (i) Power PC interrupts Structure
    (ii) 8085 instruction set
    (iii) Memory hierarchy

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