Code No. 11390 / A/ CBCS

FACULTY OF ENGINEERING

B.E. (Civil) III-Semester (CBCS) (Suppl.) Examination, May / June 2019

Subject : Electrical Technology (Part-A)

Time : 1 ½ hours **Max. Marks : 38**

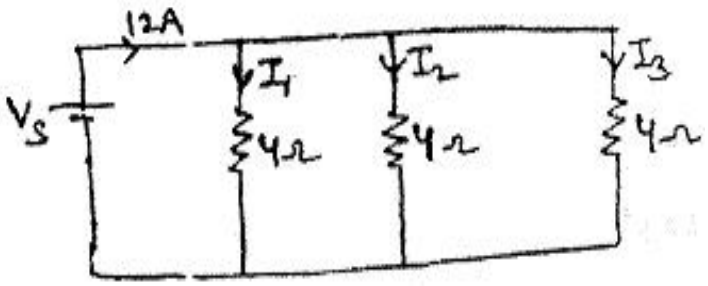
Note: Answer all questions from Part-A. Answer any Three questions from Part-B.

PART – A (14 Marks)

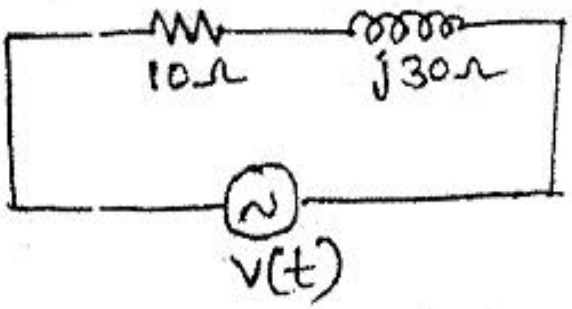
1	Define Kirchhoff's laws.	2
2	Draw star and delta connection.	3
3	Draw the circuit diagrams for open circuits and short circuit test on transformer.	3
4	Write the working principle of single phase energy meter.	2
5	Write the relationship between voltages and currents in delta connection.	2
6	Classify dc machines	2

PART – B (24 Marks)

7 a) Determine current thru each resistor in the circuit shown below. 4



b) In the circuit shown a voltage of v(t) = 50sin ($\omega t+30^0$) is applied. Determine the true power, reactive power and power factor. 4



8 a) Explain the principle of dc generator and motor. 4

b) Three 100 ohm non inductive resistors are connected in i) star ii) delta across a 400V, 50 Hz. Supply. Calculate power taken from the supply in each case. 4

9 Explain torque-slip characteristics of three phase induction motor. 8

10 Explain how rotating magnetic field is produced in three phase induction motor. 8

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Code No. 11391/CBCS/S

FACULTY OF ENGINEERING

B.E. III-Semester (CBCS) (Civil) (Suppl.) Examination, May / June 2019

Subject : Mechanical Technology (Part-B)

Time: 3 Hours **Max. Marks: 37**

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

PART-A (13 Marks)

1	What is the criteria for selection of equipment for construction	2
2	What are the factions that affect the output of scraper	3
3	Explain the importance of aerial ropeway	2
4	Write the construction of the following equipments (i) Differential and worm geared chain hoists (ii) guyed domiciles	3
5	Give the application of (i) Revolving screen (ii) paving bealur	3

PART-B (24 Marks)

6.	a)	Briefly explain the interrelationship amongst material to be excavated, bucket type. bucket size and bloom length	6
	b)	Explain the construction and operation of brucket wheel enervator	2
7	a)	What are felt conveyors? What are its applications? Show an arrangement of a belt conveyor system for transporting material from a ship to one handling plant	6
	b)	What is the working principle of forte lift truck	2
8	a)	Describe the role of compressed air in heavy construction and explain how compressed air is obtained	5
	b)	Distinguish between the tilting and non tilting type of concrete miners	3
9		Discuss the role of tractors in earth moving what considerations govern solution of wheel type or crawler type tractor on a job? Compare the application of two types of tractors	8
10	a)	What are the functions of a crane? Explain the constructional features and working of a whirled crane with a neat sketch	5
	b)	What are the applications of screens in construction in work	3

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Code No. 11397/CBCS/S

FACULTY OF ENGINEERING

B.E. III-Semester (CBCS) (Civil) (Suppl.) Examination, May / June 2019

Subject: Electronic Engineering-II

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

Note: Answer all question From Part-A & Any Five question From Part-B

Part – A (20 Marks)

1. Distinguish between Voltage amplifiers and power amplifiers. 2
2. Discuss the advantages of cascaded amplifier? 2
3. What are the advantages of negative feedback amplifiers? 2
4. Explain the need for coupling in amplifiers. 2
5. Derive the expression for gain in negative feedback Amplifiers. 2
6. Define Barkhausen's Criteria to oscillations. 2
7. Mention the advantages and disadvantages of Class B Amplifiers? 2
8. Classify Power amplifiers briefly. 2
9. Explain an unbiased negative clipper with waveforms. 2
10. How does a HPF act as Differentiator? 2

Part – B (50 Marks)

11. a) Draw the equivalent circuit of a Current Series feedback amplifier and derive the expressions for R_{if} and R_{of}. (6)
    b) Compare local and global feedback (4)

12. a) Discuss in detail the operation of RC coupled amplifier with a neat Circuit diagram Mention its applications. (6)
    b) Explain the effect of Cascading on Bandwidth of an amplifier (4)

13. a) In an amplifier the maximum Voltage gain is 1500 and occurs at 1 Khz. It falls to 1060.5 at 20 Hz and 20 Khz . Determine the i) Lower cut-off frequency ii) higher cut-off frequency and iii) Bandwidth? (5)
    b) Discuss the various kinds of distortions in Amplifiers. (5)

14. a) Distinguish between Oscillators and Amplifiers? (3)
    b) Derive an expression for frequency of oscillation of Wein bridge oscillator? (7)

15. a) Explain the Operation of a Push- pull amplifier with a neat sketch? (5)
    b) What is cross over distortion? How do you eliminate it? Explain with neat sketches? (5)

16. a) Discuss the operation and derive the expressions for Square wave response of an RC HPF? (6)
    b) Explain biased negative clamper with neat sketches. (4)

17. Write short notes on the following (10)
    a) Darlington amplifier
    b) Class-C Amplifiers
    c) Frequency stability of oscillators.

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Code No. 11404/CBCS/S

FACULTY OF ENGINEERING

B.E. III-Semester (CBCS) (ECE) (Suppl.) Examination, May / June 2019

Subject : Elements of Mechanical Engineering

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

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

PART-A (10x2 =20 Marks)

1 Write the steady flow energy equation for an open system
2 State first law of thermodynamics
3 Explain closed, open and isolated system
4 Compare petrol and diesel engine
5 How do you define thermal conductivity of a material
6 State Wein's displacement law
7 Define opaque body with respect to heat property
8 Define slip and velocity ratio in belt drives
9 Draw a neat sketch of a spur gear. Write the nomenclature
10 List applications of welding and brazing process

PART-B (5x10=50 Marks)

11. a) Explain second law of thermodynamics 4
b) 1kg of gaseous co2 contained in a closed system undergoes a reversible process at constant pressure. During this process 42KJ of internal energy is decreased. Determine the work done during the process Take C_p=840 J/kg^{o}c and C_V=600 J/kg^{o}c 6

12 a) Explain with neat sketches working of two-stroke diesel engine 4
b) A six –cylinder, four stroke petrol engine having a bore of 90mm and stroke of 100 mm has a compression ratio of 7. The relative efficiency with reference to indicated thermal efficiency is 55% when the indicated specific fuel consumption is 0.3kg/kwh. Estimate the calorific value of the fuel and fuel consumption (in Kg/h), given that IMEP is 8.5 bar and speed is 2500rpm 6

13 a) Derive an expression for the LMTD for parallel flow heat exchanger 4
b) An exterior wall of a house may be approximated by a 0.1m layer of common brick (K=0.7 W/m^{o}c) followed by a 0.04m layer of gyspsum plaster (k=0.48 W.m^{o}c). What thickness of loosely packed rock wool insulation (k=0.065 W.m^{o}c) should be added to reduce the heat loss or gain through the wall by 80% 6

14 a) Explain simple gear train and compound gear train 5
b) Derive an expression for length of belt in open belt drive 5

15 a) What are the different operations carried out on a lathe? Explain taper turning in detail with sketch 5
b) Explain the difference between forward and backward extrusion 5

16 a) Explain the importance of value timing diagram with neat sketch 5
b) Explain the working of EDM with neat sketch 5

17 a) Write short notes on the following:
a) Air compressors working 4
b) Advantages of belt drives 3
c) Rolling process in metal forming 3

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Code No. 11409 / CBCS / S

FACULTY OF ENGINEERING

B.E. (M/P/AE) III-Semester (CBCS) (Suppl.) Examination, May / June 2019

Subject : Mechanics of Materials

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

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

PART – A (20 Marks)

1 Define ductility and malleability.

2 Explain Poisson's ratio.

3 What is meant by point of contraflenure.

4 Find the sectional modulus of rectangular section.

5 Clearly explain principal plane and principal stress.

6 Define core of the section.

7 Write the limitations of Macanlay's method.

8 What is the use of strain energy?

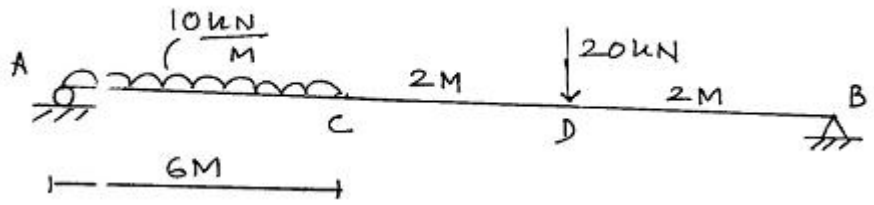
9 Write the difference between laminated spring and closely coiled spring.

10 Explain Torsion and Bending moment.

PART – B (50 Marks)

11 Derive the relation between three elastic constants "K", "$\frac{1}{m}$" and "E".

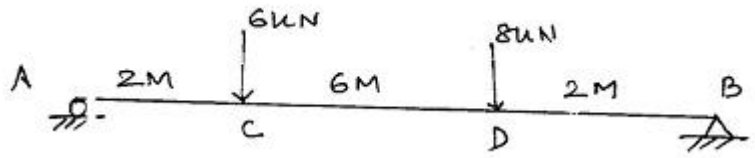
12 Draw shear force diagram and bending moment diagram of the given beam.



13 A point is subjected to tensile stresses of 70 MPa and compressive stress of 50 MPa acting on two mutually L^{er} (perpendicular) planes and shear stress of 10 MPa on these planes. By using Mohr's circle, determine normal stress shear stress and resultant stress on a plane at 60 to the am's of major stress.

14 a) Write down the assumptions in theory of pure bending or simple bending.
b) A simply supported beam 2m long has a cross section 150 mm wide and 600 mm deep it carries on UDL of 90 kN/m over entire span. Calculate the man bending stress at the extreme fibre of the cross-section.

15 Find the deflection Y_C and Y_D of the given beam.



16 A solid shaft is subjected to a torque of 15 kN-m. Find the necessary diameter of the shaft if the allowable shear stress is 60 MPa, and allowable twist is 1^0 degree in a length of 20 diameter of the shaft. Take C = 0.84 x 10^5 MPa.

17 A closely coiled helical spring of 100mm mean dia is made of 10mm dia wire and has 20 turns. The spring carries an anial had of 150N. Determine the shear stress taking the modulus of rigidity to be 1.1 x 105 MPa. Also find the deflection when carrying this load. Also calculate the stiffness of the spring.

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Code No: 11417/CBCS/S

FACULTY OF ENGINEERING

BE III - Semester (CBCS)(CSE) (Supplementary) Examination, May /June 2019

Subject : Basic Electronics

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

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

Part - A (20 Marks)

1. Define mobility of a carrier 2
2. What is the difference between center tapped FWR and bridge FWR? 2
3. In a transistor if $\propto$=0.9, determine β. 2
4. The trans conductance of a FET g_m = 4000 μs, drain resistance = 1.5 MΩ, calculate amplification factor 2
5. The feedback amplifier has a voltage gain of 500 without feedback. Determine the voltage gain with feedback if feedback ratio is 0.1 2
6. Draw the equivalent circuit of a crystal and give the expressions for resonant frequencies 2
7. What is the slew rate of an op-amp whose output voltage changes by 30V in 4 μ sec. 2
8. Realize OR gate using NAND gates only. 2
9. Explain strain gauge – briefly. 2
10. Differentiate LED and photo diode. 2

PART – B (50 Marks)

11. a) What properties of semiconductor are determined from hall effect experiment? Derive the expression for hall effect. 5

    b) In a filtered bridge rectifier circuit, the primary is connected to a 115V rms, 50Hz source, and filter consists of C=50 uf and RL = 2.2 K Determine ripple factor 5

12. a) Give reasons why CE configuration is widely used in amplifier circuits 5

    b) Obtain transfer characteristics of FET and explain? 5

13. How negative feedback modifies the impedances of amplifier? Explain with mathematical expression 10

14. a) Draw the circuit of an instrumentation amplifier using UP-AMP and explain its operation 5

    b) Give the truth table of full adder 5

15. Draw the static V-I characteristics of SCR and explain its modes of operation 10

16. Explain the working of an 'LC' filter for a FWR and derive the expression for ripple factor 10

17. a) Explain Barkhavsen criteria for oscillations 5

    b) Explain the working of a 'thermistor' for temperature sensing. 5

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Code No. 11425 / CBCS/S

FACULTY OF INFORMATICS

B.E. (I.T) III – Semester (CBCS) (Suppl.) Examination, May / June 2019

Subject: Probability & Random Processes

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

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

PART – A (10x2 = 20 Marks)

1 Write axiomatic definition of probability. 2M

2 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. 2M

3 State the properties of characteristic function of a random variable. 2M

4 If a random variable X is uniformly distributed over (0, 10), Find its mean & variance. 2M

5 Define Covariance. 2M

6 If X, Y are random variables and a, b are constants then prove that Var (aX+bY) = a^2Var(X) + b^2Var(Y) + 2ab.Cov(X, Y). 2M

7 Define Mean Ergodic and Correlation Ergodic process. 2M

8 Write any three properties of Autocorrelation. 2M

9 State Wiener-Kintchine theorem. 2M

10 Define White Noise and Colored Noise. 2M

PART – B (5x10 = 50 Marks)

11 a) Two persons A and B alternately throw a pair of die. A wins, if he gets the sum of two dice 7 before B gets 9. B wins, if he gets the sum of two dice 9 before A gets 7. If A starts the game, find the probability that A wins the game. 4M

b) A box B1 contains 10 white and 3 black balls, and another box B2 contains 3 white and 5 black balls. Two balls are selected at random from the first box B1 and placed in the second box B2. Then a ball is taken out at random from the second box B2.
i) Find the probability that it is a white ball.
ii) If it is a white ball find the probability that 2 black balls are moved from B1 to B2.

12 a) In a game of rolling a pair of dice a random variable X is defined as sum of the numbers on the dice. Find the Moment Generating Function of the random variable X, & hence compute its mean & variance. 6M

b) If a continuous RV 'X' has a pdf $f_x(x) = \left\{\frac{2(x+1)}{9}\right\}$; -1 < x < 2. Find the pdf of Y such that Y=X^2. 4M

13 a) Find the following, if joint density of two continuous random variables X & Y is given by f(x, y) = k.($x^3y + xy^3$) ; 0 < x <2 & 0 <y< 2
i) k
ii) Marginal density functions of X & Y
iii) Cov(X, Y)
iv) E[X/Y]
v) E[Y/X] 10M

14 a) Define stationary process. What are the necessary and sufficient conditions for a process to be stationary? 3M

b) 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. 7M

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.

$$H(f) = \frac{1}{1 + i2\pi fRC}$$ 10M

16 a) A person X speaks truth 4 out of 5 times. A die is rolled & he reports that it is a 6. Find the probability that it was actually a 6. 5M

b) Derive the expressions for mean & variance of exponential random variable. 5M

17 a) For the joint probability distribution of two discrete random variables X& Y is given below. Find 5M

i) Marginal distributions of X& Y

ii) Conditional Mean of X given the value of Y=1

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

b) Over a period of 12 hours, 180 calls are made at random. What is the probability that in a two hour interval the number of calls is between 25 and 35? 5M

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