FACULTY OF ENGINEERING

B.E. (Civil) IV-Semester (CBCS) (Supplementary) Examination, December 2019 / January 2020

Subject : Hydrology and Water Management

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	Explain Hydrologic Equation.	2
2	Define rain gauge density.	2
3	What are the different forms of precipitation?	2
4	What are the measures taken to reduce reservoir evaporation?	2
5	What are the factors, which affect infiltration?	2
6	What are the applications of unit hydrograph?	2
7	Define Transmissibility of an aquifer.	2
8	Define consumptive use.	2
9	What are the factors affecting duty?	2
10	Define the term Time series.	2

PART – B (50 Marks)

11 a) Describe Recording and Non-Recording type of rain gauge stations.   5

   b) For a drainage basin of 600km^2, isohyets drawn for a storm gave the following data.   5

Isohyets(cm)	40	35	30	25	20	15	10
Catchment area enclosed (km^2)	---	35	90	150	310	430	600

   Estimate the average depth of precipitation over the basin.

12 a) Differentiate between the infiltration capacity and the infiltration index. How would you measure the infiltration capacity?   5

   b) For a river, the estimated flood peaks for two return periods by the use of Gumbel's method are as follows :

Return period in years	100	50
Peak flood (m^3/sec)	435	395

   What flood discharge in this river will have a return period of 1000 years?   5

13 a) Enumerate various methods of flood estimation. Describe flood frequency analysis.   5

   b) The ordinates of 4 hour unit hydrograph are given in the table. Compute the ordinate of 8 hour unit hydrograph.   5

Time (hrs)	0	4	8	12	16	20	24	28	32	36	40	44
Unit hydrograph (cumes)	0	20	50	150	120	90	70	50	30	20	10	0

14 a) Explain , with a neat sketch, occurrence of ground water at various locations below earth surface. Also, explain clearly, unconfined aquifer and confined aquifer. 5

   b) Derive an expression for discharge from a well which is fully penetrated in confined aquifer. 5

15 a) Write short notes on probability distribution. 4

   b) For the grouped data of the annual floods, find the mean, median and mode. Determine the coefficient of skewness and the coefficient of variation. 6

Class interval (1000 cumes)	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20
Frequency	0	17	27	18	18	3	0	2	1	1

16 a) Define Duty, Delta and Base period. Derive the relationship between them. 5

   b) A water course has a culturable commanded area of 1200 hectares. The intensity of irrigation for crop A is 40% and for B is 35%, both the crops being Rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of the water course if the depth for crop A is 10 cm and for B it is 16 cm. 5

17 Write short notes on 10
   a) Depth area duration curves
   b) Recuperation test
   c) Crop rotation

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FACULTY OF ENGINEERING
B.E. (EEE) IV - Semester (CBCS) (Suppl.) Examination, December 2019 / January 2020

Subject: Electrical Circuits - II

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

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

PART – A (20 Marks)

1 What are the advantages of Exponential Fourier analysis?   2

2 Define time shift property of Fourier Transform?   2

3 Find the inverse Laplace of $F(s) = 1 + \frac{3}{s+9} - \frac{9}{s^2} + \frac{7}{s}$ 2

4 Find the Laplace transform of $e^{-at}\cos(wt)$.   2

5 Derive the reciprocity conditions for Z parameters.   2

6 Find the T port network for the given circuit, R=9 .   2
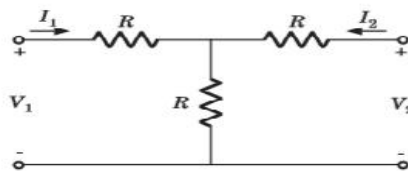
7 Find the value of a in P(s) so that polynomial is Hurwitz.   2

   $P(s) = -s^4 + s^3 + as^2 + s + 2$

8 Write the properties of Positive real functions.   2

9 Write the properties of incidence Matrix.

10 Check the given function is Hurwitz or not P(s)= $5s^3 + 3s^2 + 5s + 6$ 2

PART- B (50 Marks)

11 Find the response $i_0(t)$ of the circuit of fig if the input voltage v(t) has Fourier series expansion v(t)=$1 + \sum_{n=1}^{\alpha} \frac{2(-1)^n}{1+n^2}(\cos nt - n\sin nt)$.   10
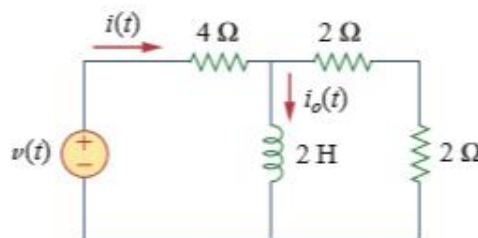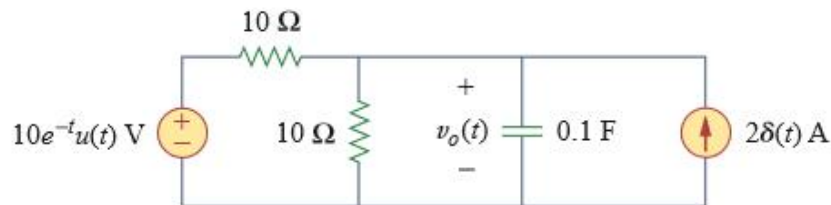
12 The ABCD parameters of the two port network shown in fig $\begin{bmatrix} 8 & 40 \\ 0.2 & 4 \end{bmatrix}$ the

output port is connected to a variable load for maximum power transfer find R_L and maximum power transferred. 10
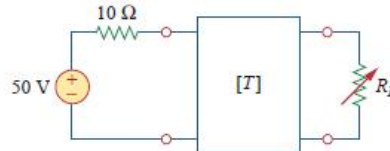
13 Find $v_0(t)$ in the circuit. Assume $v_0(0) = 5V$. 10

14 Determine the Cutset matrix and loop Matrix for the given graph, consider as solid lines are branches and dotted lines are links of the Graph. 10
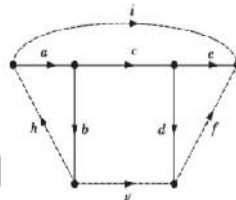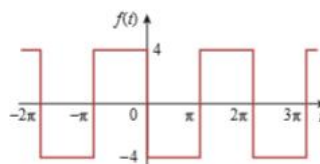

15 Synthesize the first foster form of the $Z(s) = \dfrac{s(s^2+10)}{(s^2+4)(s^2+16)}$. 10

16 (a) Check if the polynomial is Hurwitz or not $P(s) = s^3 + 2s^2 + 3s + 6$. 5
(b) Find the transmission parameters of the given network. 5

17 (a) Calculate the Laplace Transform of the periodic function in figure 5

(b) Find the Fourier series of the given wave form. 5

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FACULTY OF ENGINEERING
B.E. (Inst.) IV-Semester (Suppl.) Examination, December 2019 / January 2020

Subject: Electrical 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 Define armature reaction. (2)

2 A 4 pole generator having wave wound armature winding has 51 slots, each slot containing 20 conductors. What will be the voltage generated in the machine when driven at 1500 rpm assuming flux per pole to be 7.0 mwb? (2)

3 Given a single-phase transformer frequency f = 50hz, primary turns N_1 = 22, flux density B = 1.5, area = 60 cm^2 find primary emf. (2)

4 Why transformer rating is in KVA? (2)

5 Write the emf equation of synchronous generator. (2)

6 Draw the phasor diagram of salient pole synchronous motor for lagging power factor. (2)

7 Write the principle of operation of polyphase induction motor. (2)

8 List the starting methods of induction motor. (2)

9 Draw the torque slip characteristics of single-phase induction motor with forward and backward slip. (2)

10 Write any two differences between stepper motors and micro motors. (2)

PART – B (50 Marks)

11 (a) Draw characteristics of shunt, series generators. (5)

    (b) A shunt generator delivers 450A at 230V and the resistance of the shunt field and the armature are 50 Ω and 0.03Ω respectively. Calculate the generated emf. (5)

12 (a) What is the necessity of starter in motors? (2)

    (b) What are the types of starters and with neat diagram explain about four-point starter? (8)

13 (a) Derive the emf equation of transformer. (5)

    (b) Write a short note on auto transformer. (5)

14 A 50kVA, 4400/220V transformer has R_1=3.45Ω, R_2 = 0.009Ω, the values of reactances are X_1=5.2Ω and X_2 = 0.015 Ω. Calculate from transformer (i) equivalent resistance as referred to primary (ii) equivalent resistance as referred to secondary (iii) equivalent reactance when referred to primary (iv) impedance when referred to secondary (v) total copper loss when referred to primary? (10)

15 (a) With neat diagram explain the constructional details of synchronous generator. (7)

    (b) Define K_d and K_p. (3)

16 (a) Write any one starting methods of 3-∅ induction motor. (5)

    (b) The power input to a 3-∅ induction motor is 60 KW. The stator losses total is 1 KW. Find the mechanical power developed and the rotor copper loss per phase if the motor is running with the slip of 3%? (5)

17 Write about capacitor start and capacitor run induction motor with neat diagram and characteristics. (10)

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FACULTY OF ENGINEERING
B.E. (ECE) IV - Semester (CBCS) (Suppl.) Examination,
December 2019 / January 2020

Subject: ELECTROMAGNETIC THEORY & TRANSMISSION LINES

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

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

PART – A (2 x 10 = 20 Marks)

1   Write the related expression between Cartesian coordinates and spherical coordinate system.

2   The point charges Q_1 = 1mc, Q_2 = 2mc, and Q_3 = -3mc are respectively located at (0,0,4) , (-2,6,1) and (3,-4,-8). Calculate the force on Q_1 ?

3   Define the magnetic scalar potential?

4   Biot – Savart's law, which is similar to coulomb's law. State that the related expressions?

5   Write the expression for uniform plane waves in conducting medium.

6   Define pointing theorem and its applications.

7   A load of 100 + j150 is connected to a 75 lossless line. Find the normalized load impedance.

8   Draw the block diagram at distributed parameters of a two – conductor transmission line.

9   Define standing wave ratio and write its expression.

10 What is importance of smith chart and its applications?

PART – B (5 x 10 = 50 Marks)

11 (a) Determine the Electric Field Intensity of surface charge distributions.
   (b) The line x = 0, Z = 2 is rotated through 90^0 about the point (0,2,2) so that it becomes x = 0, y = 2, Find E at (1,1,-1).

12 (a) Explain the Stoke's theorem and its applications.
   (b) A thin ring at radius 5 cm is placed on plane Z=1cm so that its center is at (0,0,1cm). If the ring carries 50mA along $a_\varnothing$. Find H at (0, 0, -1 cm).

13 (a) Explain the reflection by a perfect conductor – oblique incidence?
   (b) In free space (Z 0), a plane wave with H_i = 10 cos (10^8t – Z) a_x mA/m is incident normally on a lossless medium (=2 $_0$, µ = 8µ$_0$) in region Z 0. Determine the reflected H_r , E_r ?

14 (a) A air line has a characteristic impedance of 70 and a phase constant of
3 rad/m at 100 MHz. Calculate the inductance per meter and capacitance per
meter of the line.
  (b) find the characteristic impedance of short circuit lines and their significance.

15 (a) An antenna with an impedance of 40 + j30 is to be matched to a 100
lossless line with a shorted stub. Determine
    (i) The required stub admittance.
    (ii) The distance between the stub and antenna.
  (b) Briefly explain single – stub matching?

16 (a) Briefly explain Brewster angle and Fresnel's equation.
  (b) Explain the distortion less transmission line?

17 (a) Explain Campbell's Formula and its importance of transmission line.
  (b) What is uniform plane waves and explain the wave equation in conducting
Medium.

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FACULTY OF ENGINEERING
B.E. (M/P/AE) IV – Semester (CBCS) (Suppl.) Examination, December 2019 /January 2020

Subject: Kinematics of Machines

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 State the Grubler's criterion and its relevance.
2 Show the arrangement of links in quadric cycle chain and slider crank chain.
3 Define Kennedy's theorem.
4 How do you find magnitude and direction of Coriolis components of acceleration.
5 Differentiate uniform pressure and uniform wear criteria used in friction problems.
6 Give the classification of kinematics pairs and kinematic chains.
7 State the condition for proper steering of a four wheeler.
8 Write the conditions for maximum power transmitted by the belt.
9 What is interference in involute gears? How to avoid it?
10 Discuss the influence of centrifugal tension on power transmission in a belt drive.

PART – B (5x10 = 50 Marks)

11 Explain clearly the inversions of slider crank chain with applications.

12 In a slider crank mechanism, crank and connecting rod lengths are 125 mm and 500 mm respectively. The center of gravity of connecting rod is 275 mm from slider end. The crank speed is 600 rpm clockwise. When the crank has turned through 45° from IDC, determine slider velocity and velocity of center of gravity of connecting rod. Also determine the angular velocity of connecting rod.

13 The shaft of a collar thrust bearing rotates at 200 rpm and carries an end thrust of 10 tonnes. The outer and inner diameters of the bearings are 480 mm and 280 mm respectively. If the power lost in friction is not to exceed 8KW, determine the coefficient of friction of the lubricant of the bearing.

14 Determine the axial force required to engage a cone clutch transmitting 25 KW of power at 750 rpm. Mean diameter of friction cone is 400 mm and mean pressure intensity is 60 KN/m². Semi cone angle is 10° and µ=0.25. Also find the width of the friction cone.

15 Draw the cam profile using the following data. Follower moves with SHM during ascent and descent. Least cam radius = 50mm; angle of ascent=90°; angle of dwell=60°; angle of descent = 120°; follower dwells during the remaining angle; follower lift=40mm; roller diameter=30mm. determine the maximum velocity and acceleration during ascent and descent when the cam rotates at 360 rpm.

16 A 20° involute pinion with 20 teeth drives a gear having 60 teeth. Module is 8 mm and addendum of each gear is 10 mm. a) State whether interference occurs or not? Give reasons. b) Find contact ratio. c) Find the maximum sliding velocity.

17 Write short notes on the following with figures
   a) Straight line motion mechanism.
   b) Reverted gear train.
   c) Comparison of different gear tooth profiles.

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FACULTY OF ENGINEERING
B.E. (CSE) IV-Semester (Suppl.) Examination, December 2019 / January 2020

Subject : Programming Languages

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

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

PAR T – A (20 Marks)

1 List the reasons to study concepts of programming languages.   (2)

2 Draw Von Newman architecture.   (2)

3 Write in brief about evaluation of denotational semantics.   (2)

4 State the evaluation of pointers.   (2)

5 Write in brief about coercion.   (2)

6 What is short circuit evaluation?   (2)

7 Write in brief about ML.   (2)

8 Write about functions in python.   (2)

9 Differentiate between deep access and shallow access.   (2)

10 Write about ADT.   (2)

PART – B (50 Marks)

11 (a) Explain in detail about categories of variables by life time.   (5)
   (b) What are the steps for evaluation of major programming languages? (5)

12 (a) Explain in detail about the language evaluation criteria.   (5)
   (b) Discuss the following terms:
       (i) Type checking (ii) Mixed-mode assignment   (5)

13 (a) Write in detail about inheritance and explain using examples of
       C++ or java.   (5)
   (b) Evaluate the general semantics of calls and returns.   (5)

14 (a) Compare and contrast between the two implementation methods compilation
       and pure interpretation.   (5)
   (b) Define event handling with an example.   (5)

15 (a) Discuss design issues of object oriented programming languages.   (5)
   (b) Mention predicate calculus and proving theorems.   (5)

16 Write in detail about cooperation, competition synchronization methods for
   achieving synchronization.   (10)

17 Write about function programming language – scheme.   (10)

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FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) (I.T) (Suppl.) Examination, December 2019 / January 2020

Subject: Data Communications

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. What is slope over load distortion and granular noise in DM?
2. Encode the bit stream 1011001 using Manchester Coding and Pseudoternary coding.
3. What are the three modes in HDLC ? Explain briefly.
4. Define Piggy Backing.
5. Give ATM cell format.
6. Explain wavelength division multiplexing.
7. Describe mesh and tree topologies.
8. What is CSMA/CD? Explain.
9. Explain about Zigbee.
10. What is meant by frequency reuse?

PART – B (50 Marks)

11. a) Discuss the OSI model.		5M
b) Explain TCP header.		5M

12. Explain the Go-back-N ARQ mechanism in detail discussing all the possible cases.   10M

13. a) Differentiate Synchronous TDM & Statistical TDM.   5M
    b) Explain about Frame relay.   5M

14. a) Compare Bridged, Switched & Full Duplex Ethernets.   6M
    b) Describe LAN protocol stack.   4M

15. a) Differentiate First, Second & Third generation cellular systems.   5M
    b) Explain the layers of Blue tooth.   5M

16.a) Explain the services of IEEE 802.11.   4M
    b) Discuss about HDLC data link protocol.   6M

17. a) Explain stop & wait flow control technique.   5M
    b) Write notes on ADSL.   5M

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FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) II - Semester (Civil)(Backlog) Examination, Dec. 2019 / Jan. 2020

Subject : Electrical Technology (Part – A)

Time : 1½ Hours   Max. Marks: 38

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

PART-A (14 Marks)

1 Distinguish between DC and AC.   2
2 Draw the VI or IV characteristics of ideal & practical voltage and current
  sources.   2
3 Prove that in a D.C. series circuit total resistance is equal to the sum of
  individual resistance.   3
4 Differentiate between a core and shell type transformer.   3
5 Draw the torque slip characteristics of induction motor.   2
6 Define the regulation of the transformer.   2

PART-B (24 Marks)

7 (a) Use star-delta/ delta-star transformation to determine the equivalent
       resistance between the points A and B of the circuit shown in below figure.
       All the values of the resistances are in   .   4
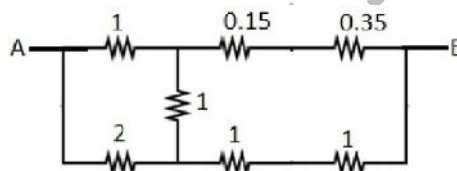
   (b) A series circuit consisting of a capacitor of 2 µF and a resistance of 500   .
       An AC source is connected to the circuit which draws a current of $50\angle0$ mA.
       The angular frequency of AC source is 400   .(i) draw the circuit and find
       the source voltage (ii) find the voltage across the capacitor and resistor
       (iii) draw the voltage phasor diagram.   4

8 (a) Explain the principle of operation of a transformer. Draw the vector diagram
       to represent a load at UPF ,lagging and leading power factor.   4
   (b) Explain in detail about conducting open circuit test on transformer.   4

9 (a) A 3-phase 50Hz induction motor has a full load speed of 960 rpm. Find the:
       i) Slip   ii) Number of poles iii) Frequency of rotor induced emf
       iv) Speed of rotor field with respect to rotor v) Speed of rotor field with
       respect to stator vi) Speed of rotor field with respect to stator field.   4
   (b) Explain in detail about the production of rotating magnetic field in three
       phase induction machines.   4

10 (a) Explain in detail about polar curves.   4
   (b) Explain the constructional details of three phase induction motor with neat
       diagrams.   4

11 (a) A 230/460V transformer has a primary resistance of 0.2 ohm and reactance
       of 0.5ohm and the corresponding values for the secondary are 0.75 and
       1.8 ohms respectively. Find the secondary terminal voltage when supplying
       10A at 0.8 p.f. lagging.   4
   (b) A circuit draws a current of 10 A at a voltage of 200 V and its power factor
       is 0.8 lagging. Calculate: i) active power ii) reactive power
       iii) apparent power. Also draw power triangle.   4

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FACULTY OF ENGINEERING
BE 2/4 (Civil) II-Semester (Backlog) Examination, December 2019 / January 2020

Subject : Mechanical Technology (Part-B)

Time: 1$^{1/2}$ Hours   **Max. Marks: 37**

Note: Answer all questions from Part-A, & Any Three Questions from Part-B.

PART-A (13 Marks)

1. List the various earth moving and excavating equipments   2

2. Differentiate between screw conveyor and Apron conveyor in terms of its constructional features   3

3. Where is bruket elevator used?   2

4. Sketch the cross section of jack hammer   3

5. Give the application of (i) paving breaker (ii) Rock drill   3

PART-B (24 Marks)

6. a) Compare the mechanism and operation of power shovel and dragline under what conditions is each machine best suited   5

   b) Write the application of different types of compacting rollers   3

7. a) Explain the functions of following components with felt conveyor system : Best, feeders and idlers   5

   b) Sketch and explain the working principle of differential and worm geared chain hoists   3

8. Describe a basic shovel and show how it can be converted into different excavating machines. What is the field of application of each of these machines   8

9. a) What are the different types of screens used in manufacture of crushed aggregate. Describe the characteristics of each   5

   b) Classify the different types of crushes and give the field of application of each type   3

10. a) Explain pumpcrete and the advantages of frams portation of concrete by pump 4

    b) Sketch and write in detail about the construction and working of trencher 4

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FACULTY OF ENGINEERING
B.E. 2/4 (EEE) II - Semester (Backlog) Examination, Dec. 2019 / Jan. 2020

Subject : Electrical Machines – 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 Explain why magnetic field is used as a coupling medium rather than electric field for energy conversion.
2 Illustrate the energy flow in electro mechanical devices.
3 Compare Lap and wave windings
4 List methods of improving commutation.
5 Series motor should never be started without mechanical load. Explain the reason.
6 Explain, why a starter is necessary for starting dc motor?
7 What are the merits and de-merits of Hopkinson's test?
8 What are the merits and de-merits of Swinburne's test?
9 Draw the equivalent circuit of transformer.
10 Define all-day efficiency.

PART – B (50 Marks)

11 Illustrate doubly excited system with a neat diagram and derive the equation for mechanical force developed.   [10]

12 (a) Explain armature reaction and derive the expressions for demagnetizing and cross magnetizing ampere turns per pole.   [5]
   (b) A 4 pole compound generator has armature, series field and shunt field resistances of 1 , 0.5 and 100 respectively. This generator delivers 4 kW at a terminal voltage of 200 V. Allowing 1 volt per brush for contact drop calculate the generated emf for i) short shunt ii) long shunt connections.   [5]

13 (a) Draw and explain the characteristics of dc series motor.   [5]
   (b) A 250 V, dc shunt motor on no load draws a line current of 5A and runs at 1200 rpm. Its armature and shunt field resistances are 0.5 and 125 respectively. Find the speed when the motor is loaded and draws 50A of current. Assume that the armature reaction weakens the flux by 4%.   [5]

14 (a) Show that in a dc generator maximum efficiency occur when variable loss equals to constant loss.   [4]
   (b) The following test results were obtained during Hopkinson's test performed on two identical shunt machines.
   Supply voltage = 250V
   Field currents = 2 A and 2.5 A
   Armature current of generator = 60A
   Current taken by two armatures from supply = 15A
   Resistance of each armature circuit = 0.2 .
   Calculate the efficiency of the motor and generator under these conditions of load. Draw the circuit diagram.   [6]

15 (a) Derive the emf equation of transformer. [4]
    (b) In a 25 kVA, 2000/200 V transformer, the iron loss and full load copper losses are 300 and 400W respectively. Calculate the efficiency on unity power factor at i) full load   ii) half full load. [6]

16 (a) Explain energy and co-energy and its importance. [5]
    (b) Explain the procedure for parallel operation of dc shunt generators. [5]

17 Write short notes on any two of the following.
    (i) Three point starter [5]
    (ii) Fields test [5]
    (iii) Sumpner's test [5]

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FACULTY OF ENGINEERING
B.E. 2/4 (Inst.) II - Semester (Backlog) Examination, December 2019 / January 2020

Subject : Electrical Machines

Time : 3 Hours   Max. Marks: 75

Note: Answer all questions from Part-A & any five questions from Part-B.
PART – A (25 Marks)

1	List the parts of D.C Machine.	[3]
2	Necessity of Starter in induction motors.	[2]
3	Draw the equivalent circuit of a transformer.	[2]
4	Types of rotors in a synchronous machine and state the advantages of each.	[3]
5	Derive the EMF equation of alternator.	[3]
6	When maximum efficiency occurs in a transformer?	[2]
7	Define Slip and discuss significance of it in induction motor.	[3]
8	What are the speed control methods in a 3 – Ø induction motor?	[2]
9	What is a synchronous condenser?	[3]
10	List the applications of Stepper motor.	[2]

### PART – B (50 Marks)

11 (a) Explain the characteristics of D.C shunt Generator.   [5]
   (b) A 4-pole 220V D.C Generator has an armature winding with 90 slots   [5]
       and 8 conductors/slot and runs at 1000 rpm .The flux / pole is 0.03 Wb.
       Determine the induced EMF when winding is (I) lap & (ii) wave connected.

12 (a) Explain the power stages & different losses in a D.C Motor.   [4]
   (b) A 300V dc motor drives a 20KW load at 1000rpm. The shunt field resistance
       is 300 ohms and armature resistance is 0.25ohms. If the motor efficiency
       is 80% determine (i) the speed at no load (ii) Rotational losses   [6]

13 (a) State and explain the principal of operation of a transformer.   [4]
   (b) A 2KVA 230/115V ,50Hz 1- Ø transformer gave the following test data: [6]
       O.C test (L.V side): 115V, 0.7A, 60W
       S.C test (H.V side): 22V, 16A,120W
       Determine the regulation & efficiency at half full load & 0.8 Lag power factor.

14 (a) Explain the Synchronous impedance method in an alternator.   [5]
   (b) Explain the operation of synchronous motor.   [5]

15 (a) Explain how rotating magnetic field setups in an Induction motor.   [5]
   (b) The Power input to a 500V, 50Hz,6 pole, 3 - Ø I.M running at 975rpm is
       30KW. The stator losses are 1KW & friction & windage losses total 2KW .
       Calculate (a) slip (b) rotor Cu loss (c) the output horse power (d) efficiency [5]

16 (a) Explain in brief the operation of split phase induction motor.   [5]
   (b) With a neat sketch explain the operation of shaded pole motor.   [5]

17 (a) Explain armature reaction in a DC Machine.   [5]
   (b) Explain why 1- Induction motor is not self-starting and how could it be [5]
       made self-starting?

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FACULTY OF ENGINEERING
BE 2/4 (ECE) II-Semester. (Backlog) Examination, December 2019 / January 2020

Subject : Signal Analysis and Transform Techniques

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 Plot the wave form for $x(t)=u(t-2)-u(t+3)+u(t-4)$.   (3)
2 Define Energy signal and Power signal.   (2)
3 Write the relationship between Laplace transform and Fourier transform. (2)
4 Define system transfer function.   (2)
5 Determine Z-transform and ROC of the discrete signal $x(n)=2^n u(-n)$.   (3)
6 Explain convolution property of Z-transform.   (3)
7 Write properties of correlation signals.   (2)
8 Perform the convolution between two signals $x1(n)=\{1,0,1,2\}$ and $x2(n)=\{1,-2,-3,0\}$. (3)
9 Test the causality of the following system. $y(t)= x(t^3)$ (3)
10 Define over sampling.   (2)

PART-B (5X10=50 Marks)

11. a) Determine the energy of the signal $x(t)=e^{-4t} u(t)$.   5
    b) Explain the basic operations can be performed on a continuous time signal?   5

12. Find the trigonometric Fourier series of the following signal x(t).   10
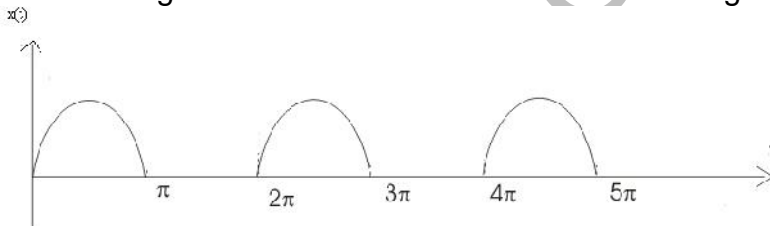
13. a) Prove linearity and time differentiation property of Laplace transform.   5
    b) Determine Fourier Transform of $x(t)= e^{-4t} \sin 3t\, u(t)$.   5

14. a) Find inverse Z-transform of $X(Z)= Z^2+Z/ Z^2-2Z+1$ if   ROC: $|Z|> 1$ 5
    b) A causal system is represented by the following difference equation. Find its transfer
        function and impulse response. $y(n)-2y(n-1)-3y(n-2)=x(n-1)$ 5

15. a) Determine the response of the LTI system whose input x(n) and impulse response
        h(n) are given by, $x(n)=\{0,2,-3,-1\}$ and $h(n)=\{2,-1,-1,4\}$ 5
    b) Differentiate between convolution and correlation?   5

16. Determine the Fourier series representation of the following periodic discrete time
    signal and sketch spectrum. $x(n)=\{…1,2,3,1,2,3,1,2,3,1,2,3,……\}$ 10

17. Write short notes on the following.   5+5
    a) Stability and causality of the system.
    b) Time shifting and scaling operations of discrete time sequences.

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FACULTY OF ENGINEERING

B.E. 2/4 (M/P/A.E) II – Semester (Backlog) Examination, January 2020

Subject: Kinematics of Machines

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 Classify kinematic pairs and give examples for each one.   3

2 What is Grubber's Criterion?   3

3 Define: 3
   i)   Body centrode
   ii) Space centrode

4 State Kennedy's theorem   3

5 State laws of friction   3

6 Explain the phenomenon of slip and creep in belt-drive   2

7 Define the following cam terminology: 2
   i)   Base circle
   ii) Pressure angle

8 Why a roller follower is preferred to a knife-edge follower?   2

9 State law of gearing   2

10 Sketch and explain epi-cyclic gear train.   2

PART – B (5x10 = 50 Marks)

11 What is inversion of a mechanism? Explain inversion of single slider crank

   mechanism.   10

12 The crank of a slider crank mechanism rotates clock-wise at a uniform speed of
   300 rpm. The crank is 150mm connecting rod is 600mm long. Determine
   (a) velocity and acceleration of the piston connecting rod, (b) angular velocity
       and angular acceleration of the connecting rod, at a crank angle of 45° from
       Inner Dead Centre position.   10

13 A belt drive is required to transmit 10 kW from a motor running at 600 rpm. The belt is
   12 mm thick and has a mass density of 0.001 gm/mm^3. Safe stress in the belt is not to
   exceed 2.5 N/mm^2. Diameter of the driving pulley is 250 mm, whereas the speed of the
   driver pulley is 220 rpm. The two shafts are 1.25m apart. The coefficient of friction is
   0.25. Determine the width of the belt.   10

14 The following data rotate to a cam profile in which the follows moves with uniform
   acceleration and deceleration during ascent and descent. Minimum radius of the
   cam = 25 mm; Roller radius = 7.5 mm; lift = 28 mm; off-set of follower axis – 12 mm
   gtowards right; Angle of ascent = 60°, Angle descent = 90°; Angle of dwell between
   ascent and descent = 45°; speed of cam = 200 rpm. Draw the profile of the cam and
   determine the maximum velocity and the uniform acceleration of the follower during
   outstroke and the return stroke.   10

15 a) Two 20° involutes spun gears have a module of 10 mm. The addendum is one module. The larger gear has 50 teeth and the pinion 13 teeth. Does interference occur? If so, to what value should the pressure angle be changed to eliminate interference?   5

   b) The Annulus A in the gear shown in Fig. (i) rotates at 300 rpm about the axis of fixed wheel-S which has 80 teeth. The three armed spider is driven at 180 rpm. Determine the number of teeth require on the wheel p.   5

Fig -(|)
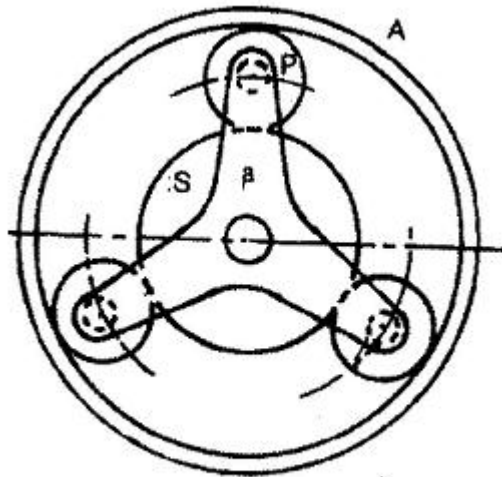
16 Explain the following: 10
   a) With a neat sketch explain the working of a Disc-clutch.
   b) Compare cycloidal and involute gear tooth profiles.

17 Write a short note on any two of the following: 10
   i)   Interference in involute gears
   ii) Band and Block Brake.
   iii) Prony Brake Dynamometer.

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FACULTY OF ENGINEERING

B.E 2/4 (CSE) II – Semester (Backlog) Examination, December 2019/January 2020

Subject: Principles of Programming Languages

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

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

PART – A (25 Marks)

1. Differentiate between deep access and shallow access.   2
2. Write an example of nested list structure in LISP.   2
3. List reasons to study concepts of programming languages.   2
4. Write about co-routines.   2
5. Write in brief about evaluation of denotational semantics.   2
6. Difference between keyword and reserved word.   3
7. Write in brief about coercion.   3
8. Inline expansions of a subroutine avoid variety of overheads. List any two of them.   3
9. Write in brief about ML.   3
10. Write two disadvantages of Dynamic Type Binding.   3

PART – B (50 Marks)

11. Discuss in detail Language Evaluation Criteria.   10M
12. a) Discuss about different parameter passing modes.   5M
    b) Compare parameter passing modes in C, C++, Pascal.   5M
13. a) Write about Prolog and mention its deficiencies.   5 M
    b) Compare imperative and functional programming languages.   5 M
14. Write in detail about Statement Level Control Structures.   10M
15. a) Explain actions and definitions of scheme functions
      LIST, EVAL, CDR, CAR, CONS.   5M
    b) Write about Data types and functions in python.   5M
16. Write in detail about explain exception handling in C++ with suitable examples.   10M
17. Write short notes on
    a) Abstract Data Type.   3M
    b) Object Model of JavaScript.   3M
    c) Mixed Mode Assignment.   4M

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FACULTY OF ENGINEERING
B.E. 2/4(I.T) II-Semester (Backlog) Examination, December 2019 / January 2020

Subject: Data Communications

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	Discuss OSI model Architecture & its services in detail.	3
2	Compare Guided and Unguided Media.	2
3	What is frequency modulation? Represent it with a wave form?	3
4	What is Piggy backing?	2
5	Define Bit stuffing. Give example.	2
6	Write about FSK and PSK techniques for digital data encoding	3
7	Describe 2G of CDMA.	2
8	Distinguish Bridge and Router.	2
9	Describe Frame relay with example	3
10	Define Single bit errors and burst errors.	3

PART – B (5X10 = 50 Marks)

11(a) Describe the formula of Shanon for Channel capacity   5
  (b) For the bit stream 11001010 sketch the wave form of any three Digital Encoding formats   5

12.Discuss Flow control mechanism with neat diagram.   10

13 a) Explain in detail about ATM Protocol Architecture.   6
   b) Explain CRC with an example.   4

14 a) Describe cellular wireless networks of 3G systems   6
   b) Distinguish between Layer 2 and Layer 3 Switches.   4

15 a) Describe cellular wireless networks of 3G systems   6
   b) Explain the concept of Parity check and CRC in error detection.   4

16 a) Explain the functioning of ARP and RARP protocols   6
   b) Explain the properties and application of Transmission media
      i) Twisted pair   ii) Coaxial cable   4

17 List the layers of TCP/IP model. What is their functionality?   10

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