Code No. 2013/BL

FACULTY OF ENGINEERING
B.E 2/4 (Civil) I – Semester (Backlog) Examination, October 2020

Subject: Engineering Geology

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

PART – A

Note: Answer any five questions. **(5x3=15 Marks)**

1 Differentiate between mineral and rock.
2 Define rock. Write any four names of igneous rocks.
3 List out common geological structures. Discuss them in brief.
4 Identify the elements at risk with respect to landslides.
5 Differentiate between Tunnel and Tsunami.
6 Explain about reservoir induced seismicity.
7 Define the terms un-confined aquifer and confined aquifer with neat sketches.
8 Explain geological consideration in selection of road aggregates.
9 Differentiate between texture and structure of the rock.
10 Define Dam. Label its parts.

PART – B

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

11 (a) How is geology related to engineering? Discuss the importance of geology in the field of Civil Engineering.
(b) Explain in detail common structure of various metamorphic and igneous rocks.

12 (a) Write the causes and effects of folding.
(b) What are the three important clay minerals and write a note on their engineering properties?

13 (a) Describe the uses and limitations of Aerial photographs.
(b) Explain various types of Bore-hole drilling.

14 (a) What are the geological considerations in the selection of concrete, highway and runway aggregate, building stones decorative stones.
(b) Write a short note on the following:
i) Tunnels in faulted region
ii) Tunnels in anticline and syncline

15 (a) Define seismic waves and mention the different properties of seismic waves.
(b) Explain the benefits of GIS in Civil Engineering.

16 (a) Explain the geological and engineering consideration in selection of concrete. aggregate and building stones.
(b) Describe engineering geology of major dams of India.

17 Write notes on the following:
a) Types of Indian soils
b) Engineering classification of rock weathering
c) Mohr's scale of hardness

****

Code No.2018/BL

FACULTY OF ENGINEERING

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

Subject: Electrical Measurements and Instruments

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

PART – A

Note: Answer any five questions. **(5x3=15 Marks)**

1. An analog indicating instrument with a scale range of 0-20.0 V shows a voltage of 10.30 V. The true value of a voltage is 10.40 volts. Express the error as a function of the true value and full scale deflection.
2. Two resistors R_1=36Ω and R_2=75Ω, each having tolerance of ±5% are connected in series. Determine the value of resultant resistance.
3. List one instrument which does not require any controlling torque. Give reason.
4. A 1mA ammeter has a resistance of 100Ω. It is to be converted to a 1 A ammeter. Find the value of shunt resistance.
5. What are the limitations of Desauty's bridge and how are they overcome by using a modified form of Desauty's bridge.
6. Calculate the insulation resistance of a cable in which the voltage falls from 100 to 80 V in 20 secs. The capacitance is 300pF.
7. List out the tests to be carried out on Ferromagnetic materials to eliminate the inaccuracies.
8. Define the following terms
   a) Remanence b) Magnetic Potential
9. Define the following terms as used for instrument transformers
   a) Turns ratio b) Burden c) Nominal Ratio
10. A standard cell of 1.0185 V used with a simple potentiometer balances at 50 cm. Calculate
    i) the emf of the cell that balances at 72 cm.
    ii) the percentage error in voltmeter which balances at 64.5 cm when reading 1.33 V2

PART – B

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

11 a) Describe the general requirements for a material to be used for shunts for ammeters and multipliers for voltmeters for PMMC instruments. What are the commonly used materials? Describe their properties as regard their suitability to be used for shunts or multipliers.

The relationship between inductance of a moving iron ammeter, the current and the position of the pointer is as follows:

Reading (A)	0.8	1.0	1.2	1.4	1.6	1.8	2.0
Deflection(Degree)	16.5	26	36	46.5	57	70	90
Inductance(μH)	527.8	573.9	575	576.2	577.3	578.35	579.45

Calculate the deflecting torque when the current is 1.5 A and 2.1 A.

10

12 a) Derive the torque equation for an electrodynamometer type of wattmeter. Comment upon the shape of the scale if spring control is used. How is it that a uniform scale is obtained when the scale span is about -45^0 to 45^0 of the position where there is zero mutual inductance between fixed and moving coils?

b) Explain how 1-Φ reactive power is measured by using electrodynamometer type wattmeter.

5

13 A four branch bridge network ABCD balanced at 1000Hz has branches AB and BC of pure resistance of 1000 Ω and 1250 Ω respectively. An unknown impedance forms the arm CD and the branch DA consists of a standard capacitor of 0.1μF capacity and negligible resistance, connected in series with a non-inductive resistance of 10 Ω to give balance. The supply voltage is 15 V and the supply is given at the points B and D. Find the components of unknown impedance and draw the necessary phasor diagram.

14 a) Explain the oscillographic method of determination of hysteresis loop of a magnetic material.
   b) Explain how flux density is measured in ring specimen.

15 a) Explain the term "standardization" of a potentiometer. Describe the procedure of standardization of a d.c potentiometer.
   b) An 8/1 current transformer has an accurate current ratio when the secondary is short circuited. The inductance of secondary is 60mH and its resistance, is 0.5 Ω and the frequency is 50 Hz. Estimate the current ratio and phase angle error when the instrument load resistance is 0.4 Ω and inductance is 0.7mH. Assume no iron loss and magnetizing current equal to I percent of primary current. The permeability remains constant.

16 Determine the ratio error and phase angle error in CT's?

17 Explain any two from the following:
   a) Extension range of PMMC Voltmeters
   b) Lissajous Figures.
   c) 3-∅ Reactive power measurement using 1-∅ wattmeter.

****

Code No : 2026/BL

FACULTY OF ENGINEERING

BE 2/4 (ECE) I – Semester (Backlog) Examination, October 2020

Subject: Electronic Devices

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

PART – A

Note: Answer any five questions. (5x3=15 Marks)

1 The reverse saturation current in a Ge diode is 5μA, Calculate the current flowing through the diode for a forward bias voltage of 0.2V.
2 For a Germanium diode calculate the voltage across the diode if the reverse current through it reaches to 90% of its saturation value.
3 Explain Avalanche break down phenomenon, what is Line and Load regulation.
4 What are the advantage and disadvantages of Bridge rectifier.
5 For a BJT If $I_B = 100\mu A, I_C = 2\ mA$, Determine α, β, γ.
6 What is Early effect in Bipolar junction transistor.
7 Draw the approximate λ -Parameter model of BJT.
8 What is TRIAC, Draw its structure and plot its V-I characteristics.
9 Differentiate between Enhancement and depletion MOSFET.
10 Explain how pinch off occurs in JFET.

PART – B

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

11 a) Explain the concept of formation of PN junction in semi conductor diode.
b) Derive the equation for dynamic resistance of a PN junction diode.

12 Draw the circuit diagram of a Full wave rectifier and explain its operation, derive its ripple factor, Efficiency, TUF, PIV, % Regulation,

13 a) Draw the circuit diagram of BJT in common emitter configuration and explain its input, output V-I characteristics.
b) Compare CE, CC or CB configurations of BJT.

14 a) For a Common Collector amplifier with R'_S = 1kΩ , R'_L = 5 kΩ assume the λ – parameters values as h_{ie} = 1.1k Ω, h_{re} = 250 μ , h_{fe} = 50 , h_{oe} = 25 μ mhos, Determine the following parameters:
i) current gain **A_I**
ii) input resistance **R_I**
iii) voltage gain **A_V**
iv) output resistance R_O
b) Derive the approximate Hybrid model of BJT

15 a) Draw and explain the V-I characteristics of JFET in Common source configuration.
b) For a JFET amplifier in Common Drain configuration, derive the expressions for
i) current gain **A_I**
ii) input resistance **R_I**
iii) voltage gain **A_V**
iv) output resistance R_O

16 a) Design a **fixed bias** circuit to establish the Q-point at I_C = 1mA, V_{CE} = 6V. Use a transistor with β = 200 and V_{BE} = 0.65V. Given V_{CC} = 12V.
b) Draw the circuit of full wave rectifier with L-C (L – section) filter and derive the expression for its ripple factor.

17 Write short notes on the following
a) UJT b) Charge Coupled device c) Sensistor compensation

****

Code No: 2030/BL

FACULTY OF ENGINEERING

BE 2/4 (M/P) I-Semester (Backlog) Examination, October 2020

Subject : Machine Drawing

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

PART-A
Note : Answer any three (3 x7 = 21 Marks)

1. Draw any two views of a hexagonal headed bolt of ϕ20M x 200mm size.
2. Explain with the aid of sketches, flat saddle key, sunk key with gib head.
3. Sketch a sectional front view and top view of a double riveted zigzag lap joint to join two plates of thickness of 12mm. indicate all proportions in terms of rivet diameter.
4. Draw simple sketch of a Ø20mm stud with 100mm long left hand threads on one side and 80mm long right hand thread on other side with a shank portion of 50mm in between the threads.
5. Draw to a suitable scale (i) Sectional front view (ii) Side view from the left, shown in fig. 1 sectioned at middle of the part.

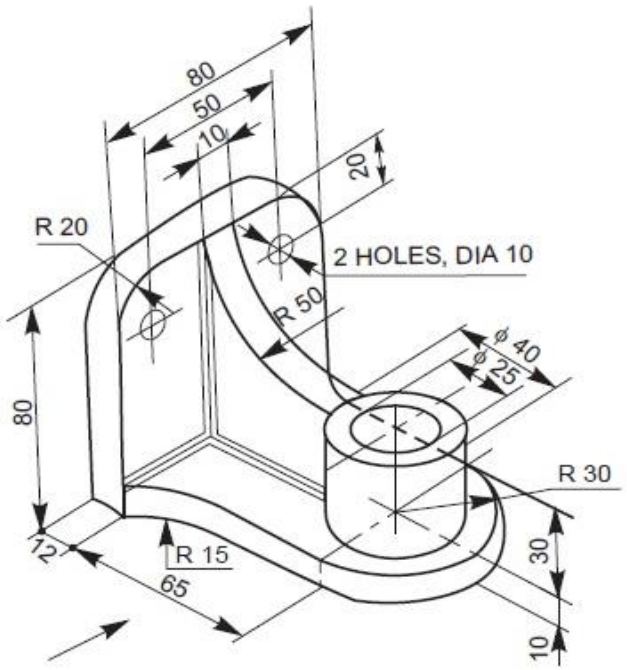


Fig. 1

Part - B

Note : Answer any two (2 x 27 =54 Marks)

6. a) Assemble the parts of the Ramsbottom safety valve, shown in Fig. 2
   b) Draw, sectional view from the front and
   c) Sectional left side view.

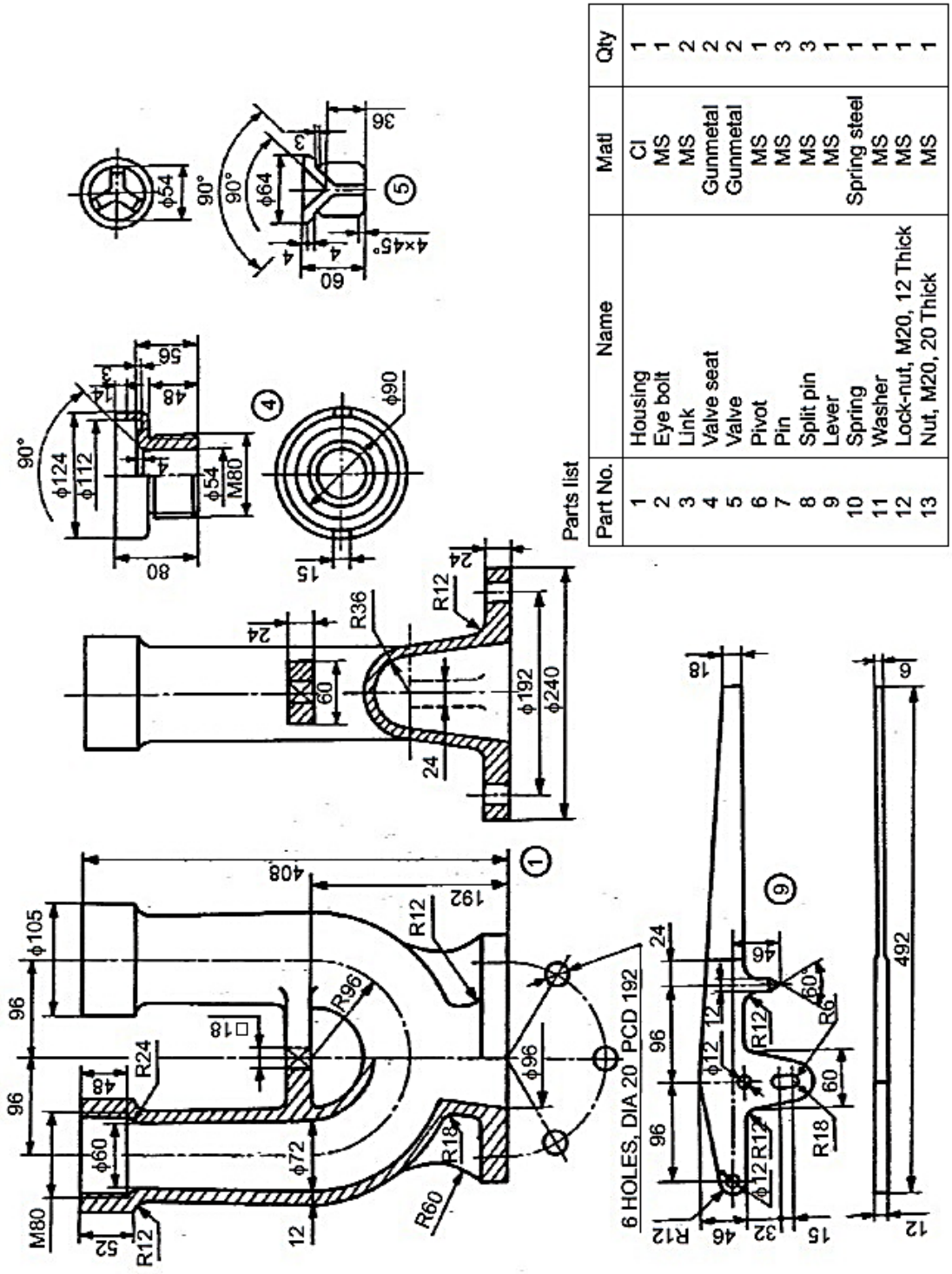


Fig. 2

****

Code No: 2033/BL

FACULY OF ENGINEERING

BE 2/4(AE) I-Semester (Backlog) Examination, October 2020

Subject: Automotive Engg. Drawing

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

PART-A

Note : Answer any three (3 x7 = 21 Marks)

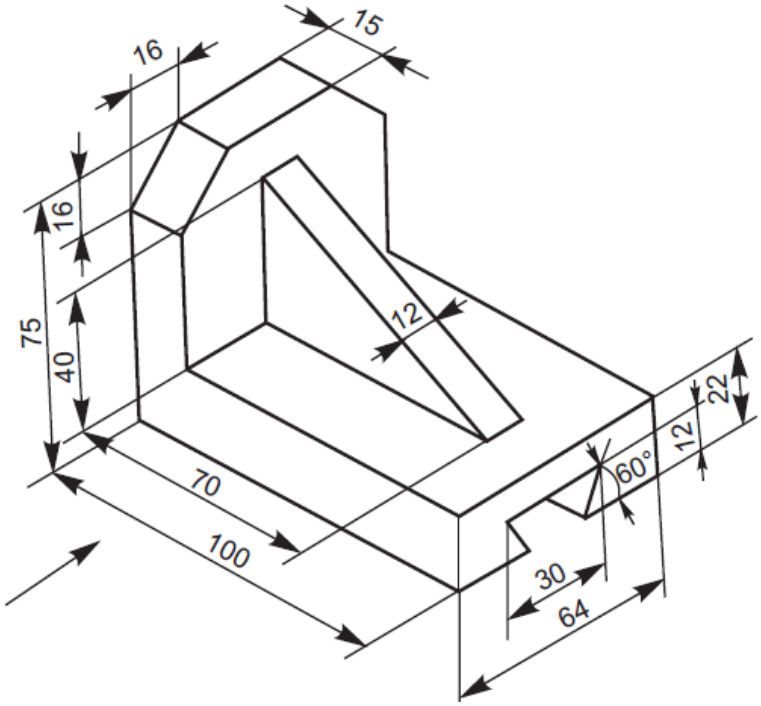
1. Sketch the (a) centre lines, (b) visible lines and (c) hidden lines.

2. Draw the top view and sectional front view of a single riveted lap joint to join plates of thickness 10mm.

3. Sketch neatly eye foundation bolt by giving suitable dimensions.

4. Draw the half sectional front view and side view of a flexible coupling having shaft diameter is 45mm.

5. Sketch sectional front view, side view and top view of the component given in figure1

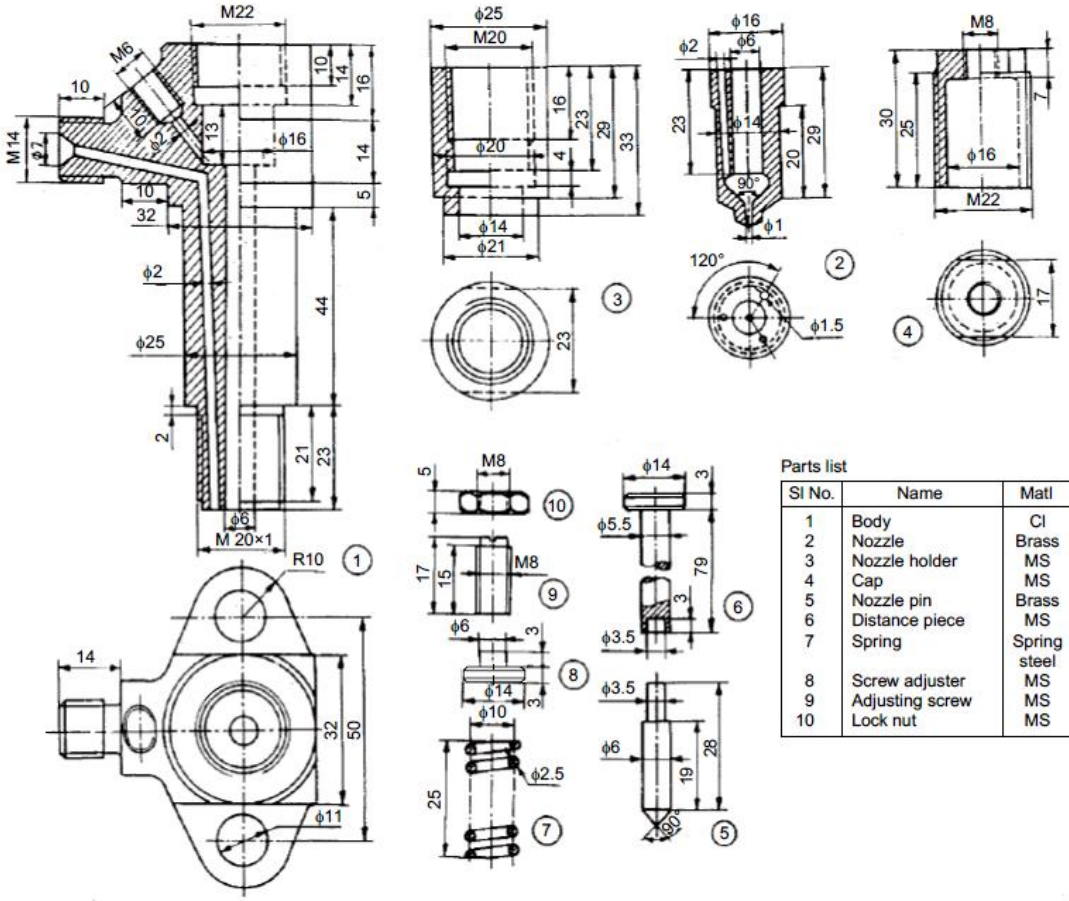


Part - B

Note : Answer any two (2 x 27 = 54 Marks)

6. a) Assemble all the components shown in figure 2 to form fuel injector assembly and draw
   b) Full sectional front view
   c) Top view

…2



Parts list

Sl No.	Name	Matl	Qty
1	Body	CI	1
2	Nozzle	Brass	1
3	Nozzle holder	MS	1
4	Cap	MS	1
5	Nozzle pin	Brass	1
6	Distance piece	MS	1
7	Spring	Spring steel	1
8	Screw adjuster	MS	1
9	Adjusting screw	MS	1
10	Lock nut	MS	1

****

Code No: 2037/BL

FACULTY OF ENGINEERING

BE 2/4 (CSE) I-Semester (Backlog) Examination, October 2020

Subject : Computer Architecture

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

PART – A

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

1. Write an RTL to describe stack operation.
2. List various registers used in a computer
3. What is the difference between a microprocessor and a micro program?
4. What are the characteristics of RISC Processors.
5. Write short notes on BCD adder.
6. Distinguish between arithmetic pipeline and instruction pipeline.
7. Compare and contrast memory mapped I/O and I/O mapped I/O?
8. What do you mean by asynchronous data transfer?
9. What is cache memory? How does it reduce the execution time?
10. How many lines of the address bus must be used to address 2048 bytes of memory?

PART – B

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

11. Give the design of a basic computer using resister transfer language.

12. a) Explain the difference between hardwired control and micro programmed control.
    b) Define an interrupt. Explain types of interrupts.

13. *a) Draw a space – time diagram for a six – segment pipeline showing the time it takes to process eight tasks*
    b) Write an algorithm for subtracting numbers with signed IS complement

14. a) Explain the modes of transfer in DMA
    b) Write the differences between programmed I/O and interrupt driven I/O.

15. a) Describe in detail about associative memory.
    b) Discuss the technique of page replacement

16. a) Define the role of each of the following components in the operation of an instruction set processor, program counter and flag register
b) Explain how the mapping from an instruction code to a microinstruction address can be done by means of a read – only memory

17. Write short notes on the following
    a. Super computers
    b. I/O Vs. Memory Bus
    c. Match logic

****

Code No: 2042/BL

FACULTY OF ENGINEERING

BE 2/4 (IT) I Semester (Backlog) Examination, October 2020

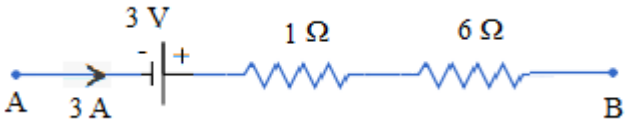
Subject: Electrical Circuits and Machines

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

PART – A

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

1. What is the potential difference between points 'A' & 'B'?

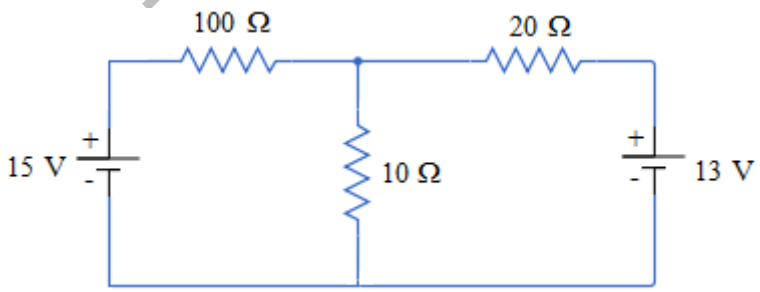


2. Define Average value, R.M.S value of Alternating voltage.
3. Distinguish between star & delta connections in three phase system.
4. Explain how power is transformed from one circuit to another circuit in a 1-phase transformer.
5. Mention the applications of DC series, DC Shunt motor.
6. What are the functions of Commutator in a DC machine?
7. A 6 pole, 50 Hz Induction motor runs at 970 rpm on full load. Calculate the percentage slip.
8. Compare squirrel cage and slip ring and three phase induction motor
9. Mention the applications of Stepper motor?
10. Mention various types of single phase induction motors.

PART – B

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

11. a) Determine current in each resistor by using loop analysis for the circuit shown below.



b) State and explain Nortons theorem.

12. a) Three similar coils are star connected to a three phase 400 V, 50Hz supply. If the inductance and resistance of each coil are 38.2 mH and 16 Ω respectively, determine

(i) line current

(ii) power factor

(iii) power consumed.

b) Derive the E.M.F. equation of a single phase transformer.

…..2

13. a) Explain various types of DC Generators.

    b) A 4- pole motor is fed at 440V and takes an armature current of 50A. The resistance of the armature circuit is 0.28Ω. The armature winding is wave connected with 888 conductors and useful flux per pole is 0.023Wb. Calculate the speed of motor.

14 a) Explain the construction details of 3- phase induction motor.

    b) Explain star-delta starting method of three phase induction motor with a neat schematic diagram.

15 a) Explain the following motors with neat schematic diagrams.

    (i) Stepper motor

    (ii) Capacitor start motor

16. a) Explain the working of 3-point starter with a neat diagram.

    b) Explain O.C test on a single phase transformer.

17. Write notes on the following

    a) BLDC motor

    b) Mutual inductance

****

Code No. 2522/CBCS/BL

FACULTY OF ENGINEERING

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

Subject : Engineering Mathematics – III
(Except-IT)

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

PART – A

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

1 Find the limit of $\underset{z \to 2i}{Lt}\ [3x + iy^2]$.

2 Define analytic function give one example of it.

3 Find the zeros and singular points of $f(z) = \dfrac{(z+1)(z-2)}{(z-3)(z+2)}$.

4 Write the statement of Residue theorem.

5 Write the fourier coefficients formulae on the interval $(-\pi, \pi)$.

6 Define half range sine series.

7 Form the partial differential equation by eliminating arbitrary constants from $Z = ax + by + a^4 + b^4$.

8 Solve $Z = p^2 + q^2$.

9 Define one dimensional heat equation.

10 Solve by separation of variables method $\dfrac{\partial u}{\partial x} = \dfrac{2\partial u}{\partial t} + u$ where $(x, 0) = 6e^{-3x}$.

PART – B

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

11 (a) Show that the function $f(z) = \sqrt{|xy|}$ is not analytic at the origin, even though CR – equations are satisfied thereof.

(b) Use Cauchy's integral formula to evaluate $\oint_C \dfrac{\cos \pi z}{z^2 - 1}\, dz$ around a rectangle with vertices.

12 (a) Expand in Taylor series $f(z) = \dfrac{z-1}{z+1}$ about the point z = 1.

(b) Expand in Laurent series of $f(z) = \dfrac{z-1}{z^2}$ for | z – 1| > |.

13 Expand $f(x) = x \sin x$ as a fourier series in the interval $0 < x < 2\pi$.

14 (a) Use Charpits method to solve $q + xp = p^2$.
(b) Solve $x^2(y - z)\, p + y^2 (z - x)q = z2\ (x - y)$.

15 A tightly stretched string of length 'ℓ' with fixed ends is initially in equilibrium position. It is set vibrating by giving each point a velocity $V_o \sin^3\left(\dfrac{\pi x}{\ell}\right)$. Find the displacement of (x, t).

..2

16 (a) Find the bilinear transformation which maps the points z = 1, i – 1, onto the points w = i, 0, - i. Find the image of | z | < |.

(b) Express f(x) = x as a half – range cosine series in 0 < x < 2.

17 (a) Find the residues of $f(z) = \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)^2 (z-2)}$ at its poles.

(b) Prove that $\int_C (z-a)^n dz = 0$ [n, any integer $\neq$ -1] where C : | z – a | = r.

*****

Code No.2553/CBCS/BL

FACULTY OF ENGINEERING

B. E. III – Semester (CBCS) (I.T.) (Backlog) Examination, October 2020

Subject: Micro Electronics

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

PART – A

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

1. Write about Full-wave rectifier.
2. Write the differences between n-p-n & p-n-p transistors.
3. What are the advantages of FET over BJT?
4. Derive the relation between α and β of a transistor.
5. State the ideal characteristics of Op-amp.
6. List the different types of feedback topologies.
7. Implement Integrator & Differentiator using an Op-amp.
8. Explain the concept of Virtual ground in an Op-amp.
9. Classify logic circuit families.
10. Draw a CMOS inverter and explain.

PART – B

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

11. (a) What is meant by Reverse Breakdown? Differentiate Zener and Avalanche breakdown mechanisms.
    (b) Explain the operation of a Half-wave rectifier. Derive is ripple factor.
12. (a) Discuss the construction and working of JFET.
    (b) Sketch the Transfer and Drain characteristics of a MOSFET.
13. (a) Analyze the operation of an RC phase shift Oscillator.
    (b) Explain how gain can be stabilized with negative feedback in amplifiers.
14. (a) Derive the gain of an Op-amp inverting amplifier.
    (b) Implement Op-amp as Adder.
15. Explain how RC phase shift oscillator works using an Op-amp.
16. (a) Define the following:
        (i) Noise Margin (ii) Fan-in and Fan-out.
    (b) Design a 2-input NOR gate and 2-input AND gate using CMOS logic.
17. Explain the operation of an Enhancement type MOSFET with the help of a neat sketch.

* * *