Code No. 11048

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) II-Sem. (Backlog) Examination, November / December 2018

Subject : Electrical Technology (Part – A)

Time : 1½ Hours **Max. Marks: 38**

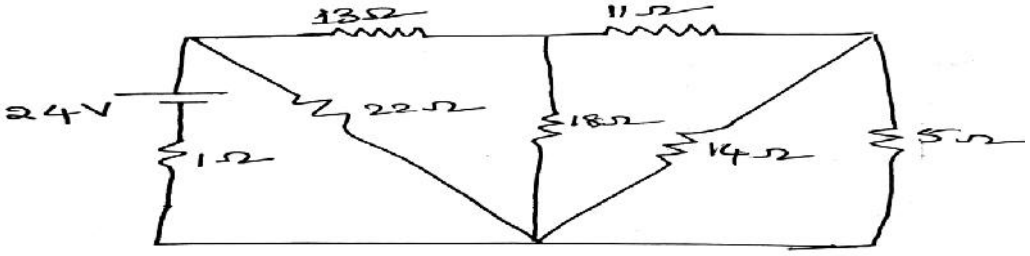
Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (14 Marks)

1. Define effective value &form factor. 3
2. What do you understand by balanced 3-phase circuits? 2
3. Why transformers are rated in KVA? 3
4. What is the condition for maximum efficiency of transformer? 2
5. Mention the various types of 3-phase induction motors & mention its applications. 2
6. The candle power of a lamp placed normal to a work plane is 30cp. find the distance, if the illumination is 15 lux. 2

PART-B (3x8=24 Marks)

7 a) Determine i) the current ii) voltage across 5Ω resistor iii) power loss in 18 Ω resistor for the circuit shown below . 5



b) What are the advantages of 3-phase system over single phase system? 3

8 a) Explain principle operation of a single phase transformer. 3

b) A 6600/440v single phase, 600KVA transformer has 1200 primary turns. Find (i) transformation ratio (ii) secondary turns (iii) voltage/turn (iv) secondary current when it supplies a load of 400KW at 0.8 power factor lagging. 5

9 a) Explain star-delta starting of a 3-phase induction motor with neat schematic diagram. 5

b) Distinguish between squirrel cage &phase wound rotor of an induction motor.. 3

10 a) Derive the expression for current, phase angle, power factor and power for R-L-C series circuit 4

b) An inductance of 50 milli henry is connected in series with a resistance of 10Ω, the voltage applied to the current is 200v, 50Hz.Calculate (i) impedance (ii) current (iii) power absorbed (iv) power factor. 4

11a) Discuss various losses in a transformer. 3

b) Briefly explain about polar curves. 5

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Code No. 11049

FACULTY OF ENGINEERING

BE 2/4 (Civil) II - Semester (Backlog) Examination, November / December 2018.

Subject: Mechanical Technology (Part-B)

Time: 1½ Hours **Max. Marks: 37**

Note: Answer ALL Questions From Part-A & Any THREE Questions From Part-B.

PART - A (13 Marks)

1 What is Hammer and Roll Crusher? (3)
2 What is a Bucket Elevator? (3)
3 Write the uses of Pneumatic Jack Hammer. (2)
4 Explain Crusher's Jaw. (3)
5 Write the applications of Concrete Vibrators. (2)

PART - B (24 Marks)

6 (a) What precautions should be taken while operating a Bucket Wheel Excavator?
(b) Differentiate between Tractors And Bull Dozers.

7 (a) How do we differentiate between Bucket Conveyor and Bucket Elevators?
(b) Explain Differential & Worm Geared Chain Hoists.

8 Write a note on Reciprocating Air Compressor with a neat sketch.

9 (a) Explain Pneumatic Jack Hammer and write its uses.
(b) How do we differentiate between Concrete Pumps and Conventional Pumps?

10 Explain.
(a) Shaking and Vibrating Screen
(b) Write the uses of construction Pneumatic Jack Hammer and Rock Drill.

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Code No. 11055

FACULTY OF ENGINEERING

B.E. 2/4 (EEE) II-Semester (Backlog) Examination, November / December 2018

Subject: Electrical Machines-I

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

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

PART-A (25 Marks)

1. Draw the block diagram to explain the flow of energy in electromechanical devices.
2. What do you understand by magnetically induced emf?
3. State the different types of dc generators with their applications.
4. What is the use of Commutator in DC machine?
5. Why armature core is laminated?
6. What is back e.m.f or counter e.m.f?
7. Why Swinburne's test is considered convenient and economical method for testing of dc shunt machines?
8. How do the various losses occurring in a dc machine vary with the load?
9. What is the condition for zero voltage regulation?
10. A 3000/200 V, 50Hz single phase transformer is built on a core having an effective cross-sectional area of 150cm^2 and has 80 turns in the low voltage winding. Calculate the Maximum flux density in the core.

PART-B (50 Marks)

11. Draw schematic diagram of a doubly excited magnetic system and derive expression for the magnetic force and torque developed in doubly excited systems. [10]

12.(a) Explain O.C.C and load characteristics of DC series generator. [5]
(b) Derive e.m.f. equation of a DC generator. [5]

13.(a)Explain about wave winding and lap winding. [5]
(b) A 4 pole dc series motor has wave-connected winding with 600 conductors. Total resistance of motor is 0.8Ω. When fed from 250V dc source the motor supplies a load of 10kW and takes 50A with a flux per pole of 3mWb.For these operating conditions, calculate the developed torque and shaft torque. [5]

14.(a) What are the methods of speed control of dc shunt motor? Briefly explain them with the help of neat diagrams. [5]
(b) A 230V dc shunt motor runs at 800rpm and takes armature current of 50A. Find the resistance to be added to the field circuit to increase speed to 1000 rpm at an armature current of 80A. Assume flux proportional to field current. Armature resistance = 0.15Ω and field winding resistance =250Ω. [5]

..2

15.(a) Explain the necessity of starter for dc motor. Discuss three point starter for dc motor. [5]

(b) A 10 kW, 200V, 1200 rpm series dc generator has armature resistance of 0.1Ω, field winding resistance of 0.3Ω.the frictional and winding loss of the machine is 200 W and brush contact drop is 1 volt per brush. Find the efficiency of the machine and the load current at which this machine has maximum efficiency. [5]

16. Explain the following: (i) Swinburne's test (ii) Hopkinson test for dc machine and also mention their importance. [10]

17.(a) For a single phase transformer having primary and secondary turns of 440 and 880 respectively, determine the transformer KVA rating if half load secondary current is 7.5A and maximum value of core flux is 2.25mWb. [5]

(b) Explain about transformer on load? [5]

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Code No. 11057

FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) II - Semester (Backlog) Examination, November / December 2018

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 Write the EMF equation of a DC machine. [2]
2 Define critical field resistance of a self excited DC machine. [3]
3 A 25 KVA transformer has a voltage ration of 3300 V/ 400 V. Find the primary current? [2]
4 Draw the equivalent circuit of a transformer referred to primary winding. [3]
5 Define distribution or breadth factor of synchronous machine. Write the formula. [3]
6 Write the advantageous of distributed winding in synchronous machine. [2]
7 A three phase, 50 Hz, six pole, induction motor runs at 950 rpm. Calculate the synchronous speed and slip. [2]
8 What are the advantageous of a squirrel cage induction motor? [3]
9 Draw the speed torque characteristics of a capacitor start induction motor. [2]
10 Draw the schematic representation of a single phase induction motor using main winding and auxiliary winding. At what angle these windings are displaced? [3]

PART-B (50 Marks)

11 (a) Derive the torque equation of a DC motor. [5]
(b) A series generator delivers a load current of 50 A at 400 V and has armature and series field resistance of 0.05 Ohm and 0.04 ohm respectively. Find the induced EMF in the armature if the brush contact drop is 1 V per brush. [5]

12 (a) Derive the expression for load at which efficiency of a transformer is maximum. [5]
(b) Find the efficiency of a 150 KVA transformer at 25 % full load at 0.8 p.f lagging, if the copper losses are 1600 W at full load and iron losses are 1400 W. [5]

13 (a) Write the comparison between synchronous motor and induction motor. [5]
(b) The input to an 11000 V , three phase star connected synchronous motor is 60 A. The effective resistance and synchronous reactance per phase are 1 ohm and 30 ohm respectively. Find the power supplied to the motor and the induced EMF for a power factor 0.8 leading. [5]

14 (a) Explain the star-delta starter method used for three phase induction motor. [5]
(b) A three phase , 50 Hz , 6-pole induction motor runs on full load with a slip of 0.04. Determine the maximum torque in-terms of full load torque. Also determine the speed at which the maximum torque takes place. (Assume that the rotor stand still impedance per phase in (0.01 + j 0.05) ohm). [5]

15 (a) Describe the working principle of a shaded pole motor. [5]
(b) A three phase induction motor develops a staring torque. But a single phase induction motor does not. Why? [5]

16 (a) Write the advantageous and dis-advantageous of a auto transformer. [5]
(b) Discuss about Krammer methods. [5]

17 (a) Explain the speed control of three phase induction motor using pole changing method. [5]
(b) Discuss about scott connection. [5]

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Code No. 11062

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II - Semester (Backlog) Examination, November/December 2018

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. Determine the even and odd components of the following signals? (3)

   a) $x(t) = U(t)$; b) $x(t) = V \sin(w_o t + \phi)$

2. Test whether the following discrete signals are periodic or not ?

   (a) $x(n) = \{\cos[\pi n/4] + \sin[\pi n/8] - 2\cos[\pi n/2]\}$ (b) $x[n]=\cos[n/2]\cos[\pi n/4]$ (2)

3. State and prove Modulation property of Fourier Transform ? (3)

4. What is meant by Half wave and Quarter wave symmetry? Explain. (3)

5. State time scaling property of Fourier transform. (2)

6. What are the applications of Laplace Transform? (3)

7. If $x(t) = \exp(-3t)\,U(t)$; and $h(t) = U(t+3)$. Find convolution using direct method? (3)

8. Distinguish between Laplace Transform vs Z-Transform. (2)

9. If $x(n) = \{ (0.5)^n * [\, U(-n\,)] - [\, 2^n\, U(-n-1)] \}$, find X(z). (2)

10. Write down few advantages of sampling the z-transform. (2)

Part B (5x10 =50 Marks)

11 a) A rectangular function is defined as follows :

$$x(t) = \begin{cases} A, & \text{for } 0 < t < \\ -A, & \text{for } < t < \\ A, & \text{for } < t < 2 \end{cases}$$

Approximate the above function by A Cos(t) between the interval [0, 2π] such that mean square error is minimum? (6)

b) Write all the properties of Dirac Delta function. (4)

12 a) Show that the functions $\sin(n\omega_0 t)$ and $\cos(n\omega_0 t)$ are Orthogonal over any interval

$\{ t_0$ to $[\, t_0 + (2\pi / \omega_0)\,]\}$? (6)

b) Distinguish between Exponential form of Fourier series and Fourier transform. (4)

13 a) Compare Fourier Transform various Laplace transforms. (4)

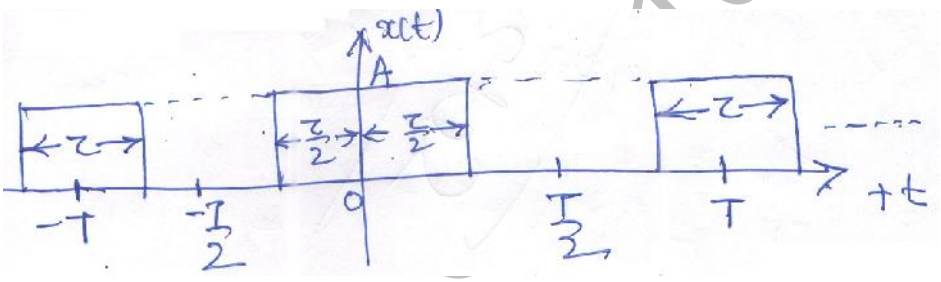
b) Find the Laplace Transform of the following signals.

1. $x(t) = [\exp(-at)\,U(t) - \exp(-bt)\,U(-t)]$; (2) $x(t) = [\exp(-2t)\,U(-t) + \exp(3t)\,U(-t)]$ (6)

14 A system is described by the differential equation given below:
$(d^2y(t)/dt^2) + 5\,(dy(t)/dt) + 4\,y(t)\,] = x(t)$; determine the response of the system to an input of $x(t) = [\exp(-2t)\,U(t)\,]$ applied at $t = 0$ sec; initial conditions are $y(0^-) = -2$ and $dy(0^-)/dt = -1$; plot ROC? (10)

15. Using Long division method determine the inverse Z-transform of X(z) given below:
(a) $X(z) = [\,(z^2 + z + 2)\,] / [\,(z^3 - 2z^2 + 3z + 4)\,]$; ROC : $|Z| < 4$; (6)
(b) Find the inverse Z-transform of the following:
(1) $X(z) = \{\, z / (2z^2 - 3z + 1)\,\}$; ROC : $|Z| < ½$;
(2) $X(Z) = \{\, z/ (2z^2 - 3z + 1)\,\}$; ROC : $|Z| > ½$; (4)

16 a) State and prove Sampling Theorem for Low pass signals. (5)
b) Find the Trigonometric Fourier series for the following waveform: (5)
Sketch magnitude and phase spectra



17 a) Find discrete Convolution for the following sequences given below
$x_1(n) = \{\, \mathbf{1}, 2, 3, 4\,\}$; $x_2(n) = \{\, -1, 4, 3, \mathbf{5}\,\}$ (4)
b) Find the Discrete Fourier Series of the following signals ;
$x_1(n) = \cos^2 n$; $x_2(n) = 3 \sin(w_0 n)$; $x_3(n) = 4 \cos(2w_0 n)$ (6)

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Code No. 11065

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/A.E) II-Semester (Backlog) Examination, Nov/Dec 2018

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 Differentiate higher and lower kinematic pairs with examples.
2 Give comparison of complete / in – complete / successful constraint motions.
3 Give the equation for number of I – Centers in a mechanism.
4 Give comparison between I – Center method and relative velocity method.
5 Define MA and VR with respect to screw jack.
6 Classify belt drives with neat sketch.
7 Narrate the importance of with sketch cam and followers with example.
8 Sketch the displacement curve model for SHM follower motion.
9 Write features of simple gear train.
10 Justify the suitable tooth profile in terms of interference.

PART – B (50 Marks)

11 Define inversions. Explain with neat sketches inversions of quadric cycle chain. Give its applications.

12 In a slider crank mechanism, the length of the crank and connecting rod are 100 mm and 400 mm respectively. The crank rotates uniformly at 600 rpm clockwise. When the crank has turned through 45° from the inner dead centre, find slider velocity and angular velocity of connecting rod.

13 A flat belt, 8 mm thick and 100 mm wide transmits power between two pulleys, running at 1600 m/min. The mass of the belt is 0.9 kg/m length. The angle of lap in the smaller pulley is 165° and the coefficient of friction between the belt and pulley is 0.3. If the maximum permissible stress in the belt is 2 MN/m^2, find: 1. maximum power transmitted and 2. initial tension in the belt.

14 A disc cam drives a knife edge follower with SHM during ascent and descent, while rotating through 120º in each motion. Follower dwells twice during the cam rotation of 60º each. Draw cam profile with minimum radius of 25 mm.

15 Two 20º involutes spur gears have gear ration of 2.5. Module is 4 mm and addendum is 1.23 times module. Pinion rotates at 150 rpm. Find
(i) Minimum number of teeth on each to avoid interference
(ii) Contact ratio
(iii) Maximum sliding velocity

16 A cone clutch with a semi cone angle of 15º transmits 10 kw at 600 rpm. Maximum allowable pressure is 100 KN/m^2. Cone width is equal to mean radius. Assume $\mu = 0.25$ determine i) Outer and Inner cone radius ii) Cone width iii) Axial force required to engage clutch.

17 Explain any Two of the following with a diagram
(i) Features of in volute gear tooth profile
(ii) Internal expanding shoe brakes
(iii) Pantograph

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Code No. 11075

FACULTY OF ENGINEERING

B.E. 2/4 (C.S.E.) II-Semester (Backlog) Examination, November / December 2018

Subject: Principles of Programming Languages

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

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

Paper – A (25 Marks)

1. What constitutes a programming environment? [2]
2. Define parse tree and draw parse tree for expression a=b/ (a+c). [3]
3. What are the advantages and disadvantages of having no types in a programming language? [2]
4. What is short circuit evaluation? Give example. [3]
5. What is an overloaded subprogram? [2]
6. Define Activation record? Give example. [2]
7. In what ways are coroutines different from conventional subprograms? [3]
8. What are the differences between a C++ throw specification and a java throws clause? [2]
9. Describe the actions of the wait and release operations for semaphores. [3]
10. Discuss the forms of Horn clauses? [3]

PART – B (50 Marks)

11. a) What effect will readability have on writability of a program,? Discuss a suitable scenario. [5]
    b) Prove that the following grammar is ambiguous: [5]
    <S> → <A>
    <A> → <A> + <A> | <id>
    <id> → a | b | c |

12. a) Describe the approach of using axiomatic semantics to prove the correctness of a program. [5]
    b) Discuss about scope and lifetime of a variable. What are the advantages of dynamic scoping over static scoping. [5]

13. a) Define name and structure type compatibility. What are relative merits of these two? [6]
    b) Write down the accessing formula for computing the location of component A[I,J] of a matrix A declared as V: array [LB1.. VB1, LB2.. VB2]. Where A is stored in column major order. Explain with illustrative example. [4]

..2

14. a) Differentiate between call by reference and call by value result parameter passing mechanism. [6]

b) What will be the output of following C program that uses parameter passing is [4]

(i) call by value

(ii) call by reference

(iii) call by value – result

```
void swap (int a, int b)  {
    int temp;
    temp = a;
    a = b;
    b = temp;
    }
Void  main ()  {
 Int value = 2, list[5] = {1,3,5,7,9};
 Swap(value, list{0});
 Swap(list[0], list[1];
 Swap(value, list[value]);
      }
```

15. a) Explain the concept of abstraction and encapsulation with suitable example. [5]

b) How to implement generic functions in C++? [5]

16. a) Write the definitions of the scheme functions EVAL, CAR, CDR, CONS and LIST, and explain their actions. [5]

b) Explain about fact and rule statements in PROLOG. [5]

17. Write short notes on the following;

(i) Data Types in Python [3]

(ii) Guarded commands [3]

(iii) Recursion. [4]

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Code No. 11081

FACULTY OF ENGINEERING

BE. 2/4 (I.T) II – Semester (Backlog) Examination, November / December 2018

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	Define Attenuation and cross talk	2
2.	Differentiate AM and DM	2
3.	Encode the bit stream 10001001 using	
	a) Manchester encoding b)Differential Manchester encoding	3
4.	What is the difference between analog transmission and digital transmission	2
5.	Briefly explain the modes of HDLC	3
6.	Explain parity check error detection technique with an example	3
7.	Write short notes on XDSL	2
8.	Define topology and explain star topology	3
9.	List the generations of cellular networks	2
10.	What is meant by CSMA/CD? Why is it needed in Ethernet	3

PART - B (50 Marks)

11.	a) Explain TCP/IP protocol architecture	5
	b) Differentiate ASK,FSK and PSK	5
12.	Explain the difference between stop and wait flow control and sliding window flow control with efficiency calculation	10
13	a) Distinguish synchronous TDM and statistical TDM	5
	b) Write in detail about ATM architecture	5
14.	a) Explain LAN protocol architecture	5
	b). Write short notes on Bridged and Switched Ethernets	5
15.	a). Explain Bluetooth layers and architecture with neat diagrams	5
	b) Explain the architecture of wireless LAN	5
16.	What is Error control? And explain types of error control techniques with examples	10
17.	a) Differentiate circuit switching and packet switching	5
	b) Write short notes on Zigbee	5

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Code No: 11389/CBCS

FACULTY OF ENGINEERING

B. E. III-Semester (CBCS) (Main & Backlog) Examination, November / December 2018

Subject: Engineering Mathematics-III (Except – I.T.)

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

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

PART- A (10x2=20 Marks)

1 State Cauchy-Riemann equations in polar form.

2 Evaluate $\int_C \bar{Z}\, dz$ where c is the straight line path joining O (0, 0) to A (3, 3).

3 Locate and classify the singularity of $f(z) = \frac{1-\cos z}{z^3}$

4 Find the residue of $f(z) = \frac{1-e^z}{z^4}$ at its pole.

5 Find the half range sine series of the function $f(x) = e^{2x}, 0 < x < 1$

6 Find b_n in the Fourier series expansion of the function $f(x) = x + x^2$ in $[-\pi, \pi]$.

7 Form the partial differential equation by eliminating the arbitrary function f from $x + yz = f(x^2 + y^2 - z^2)$.

8 Find the complete integral of $p^2 - q^2 = x - y$.

9 Solve $5u_x + 4u_y = 0$ subject to the condition $u(o, y) = 6e^{-5y}$.

10 Classify the partial differential equation $y\frac{\partial^2 u}{\partial x^2} + 2x\frac{\partial^2 u}{\partial x \partial y} + y\frac{\partial^2 u}{\partial y^2} = 0$

PART-B (5x10=50)

11 (a) Find the analytic function f (z) = u + iv where $u(x, y) = e^x (x\cos y - y\sin y)$.

(b) Evaluate $\int_C \frac{6z^2 + z}{z^2 - 1} dz$ where C is the circle $|z - 1| = 1$.

12 (a) Expand $f(z) = \frac{1}{(z+1)(z+3)}$ in a Laurent series valid for (i) $1 < |z| < 3$ (ii) $|z| > 3$

(b) Evaluate $\int_{-\infty}^{\infty} \frac{dx}{(1+x^2)^2}$

..2

13 Find the Fourier series of the function $f(x)=\begin{cases} x & \text{if} \quad 0 \le x \le \pi \\ 2\pi - x & \text{if} \quad \pi \le x \le 2\pi \end{cases}$ and hence deduce that $\frac{1}{1^2}+\frac{1}{3^2}+\frac{1}{5^2}+.....=\frac{\pi^2}{8}$.

14 (a) Solve $z(p-q)=z^2+(x+y)^2$
(b) Solve $2(z + xp + yp) =yp^2$ by using Charpits method.

15 Find the solution of the heat equation $\frac{\partial u}{\partial t}=c^2\frac{\partial^2 u}{\partial x^2}, 0 \le x \le l, t>0$ subject to the condition u(0, t) = 0 = u(ℓ, t) and $u(x, 0) = \ell x - x^2$.

16 (a) Find the bilinear transformation which maps the points 1, i, -1 onto the points $0, 1, \infty$.

(b) Evaluate $\int_C \frac{\cos(z^3)}{(z+1)^2}$ where C is the circle $|z|=2$

17 (a) Solve $\left(D^2+DD'-6D'^2\right)^z = y\sin x$

(b) Find the complete and singular integrals of $z = px + qy - 2\sqrt{pq}$

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Code No. 11422 / CBCS

FACULTY OF ENGINEERING

B.E. (I.T) III – Semester (CBCS) (Main & Backlog) Examination, Nov. / Dec. 2018

Subject: Micro Electronics

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 Differentiate Avalanche & Zener breakdown voltage of diode. (3)
2 Draw the characteristics of PN junction diode under forward bias and Reverse bias Configuration. (3)
3 Explain Pinch Off phenomenon of JFET. (2)
4 Derive the expression for voltage gain of negative feedback amplifier. (3)
5 What are the advantages of Bridge rectifier? (2)
6 Draw the schematic symbol of Op-amp. (2)
8 Define Noise margin. (3)
9 What is PUN and PDN? (2)

PART – B (5x10 = 50 Marks)

11 i) Justify the statement “Varacter diode acts as varaibel capacitor”. (5)
ii) Interpret the operation of sereis and parallel clipper. (5)
12 i) Evaluate the Transfer and Drain characteristics of JFET in detail. (5)
ii) Explain the fixed bias operation of BJT. (5)

13 i) Derive any two properties of negative feedback amplifier. (5)
ii) Analyze the operation of RC phase shift Oscillator. (5)
14 i) Derive the expression for Op-amp as Integrator. (5)
ii) Define Non-inverting amplifier. Explain the operation of Op-amp as Non-inverting amplifier. (5)

15 Design the following logic gates using CMOS: (10)
i) NAND – 2 input
ii) NOR – 2 input

16 Explain construction and working of enhancement mode & Depletion mode of MOSFET in detail. (10)

17 Write short notes on:
i) Colpitts oscillator (5)
ii) Ptype & Ntype materials (5)

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