

2013-14  
(ATKT)

QP Code : NP-18711

(3 Hours)

[ Total Marks : 80

- N. B. : (1) Question No. 1 is compulsory.  
 (2) Solve any three out of remaining five questions.  
 (3) Figures to the right indicate full marks.  
 (4) Assume data, if necessary.

1. Solve any four :- 20
  - (a) Explain measurement of medium resistance using wheatstone bridge.
  - (b) Explain different types of detector used in ac bridge.
  - (c) Write advantages and disadvantages of Hay's bridge.
  - (d) Explain resolution and sensitivity of digital meter.
  - (e) Differentiate indicating and integrating instruments.
  - (f) What is the basic requirement of transducer.
  
2. (a) What are different types of error that occur during measurement, explain each. 10  
 (b) Explain with the help of diagram operation of ramp type digital voltmeter 10  
 also write its advantage and disadvantage.
  
3. (a) Explain construction, working principle and operation of LVDT. 10  
 (b) Explain with phasor diagram how Schering bridge can be used to measure 10  
 unknown capacitor.
  
4. (a) Describe with suitable diagram how a D.C. potentiometer can be used for :- 10
  - (i) Calibration of a voltmeter
  - (ii) Calibration of an ammeter
  - (iii) Calibration of wattmeter
 (b) Describe with the diagram operation of a piezoelectric transducer ? List the 10  
 advantages and disadvantage of piezoelectric transducer.
  
5. (a) Prove that in a ballistic galvanometer, the charge is proportional to first swing 10  
 of the moving coil.  
 (b) Explain working of digital frequency meter and show it is useful for time 10  
 interval measurement.
  
6. Write short notes on :- 20
  - (a) Explain the construction and working of digital thermometer.
  - (b) Explain the construction and working of Resistance Temperature 10  
 Detector (RTD).

Con. 12823-14.



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SE - EE  
Sem III - CBSGS

CNCPG

28/5/14

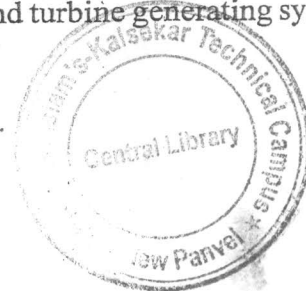
Q P Code : NP-18672

(3 Hours)

[Total Marks : 80

- N.B. :** (1) Q. No. 1 is compulsory.  
(2) Attempt any three from remaining question.  
(3) Figure to the right indicate full marks.  
(4) Assume data if necessary & Justify.

1. (a) Explain in brief solar pond. 5  
(b) Explain (i) Plant use factor 5  
(ii) Load factor  
(iii) Utilization factor  
(c) Explain (i) Radio active decay 5  
(ii) Half life.  
(d) Explain (i) Hydrologic cycle 5  
(ii) Flow duration curve
2. (a) Explain various factors and effect of fluctuating load on operation of power plant and also explain method to meet fluctuating load. 10  
(b) Explain induced drought and forced drought fans in thermal power plant. 10
3. (a) With a neat diagram explain pulverized coal burners and Fluidised Bed combustion system in thermal power plant. 10  
(b) Draw a neat layout of Hydroelectric power plant and explain in brief 10  
(i) Reservoir (ii) Dam (iii) Penstock (iv) Surge tank
4. (a) Draw a neat diagram of nuclear reactors and explain in brief essential components of nuclear reactor. 10  
(b) State advantages and disadvantages of Gas turbine power plant. 10
5. (a) How are Solar collectors classified give brief description of flat plate collector. 10  
(b) What are the advantages and disadvantages of wind energy & hence explain factors which governs the selection of site for a proposed wind turbine generating system. 10
6. Write short notes on :— 20  
(1) Ash handling system  
(2) Principle of operation of fuel cell  
(3) Diesel power plant  
(4) Boiling water reactor (B.W.R.)



SE-EE  
Sem III (CBSEGS)

31/5/14

E.D.C

QP Code : NP-18613

(3 Hours)

[Total Marks : 80

**N.B. :** 1. Q.1 is compulsory.

2. Attempt any 03 questions from remaining questions.

3. Assumed suitable data when necessary.

- Q. 1.      A) What is Zener diode? 05  
            B) What is Thermal Stabilization? 05  
            C) Explain need of biasing in BJT 05  
            D) What is coupling? Name different types. 05
- Q.2      A) What is feedback amplifier? Name different types and explain any one of them. 10  
            B) Draw and explain N-channel Enhancement MOSFET with the help of suitable diagram and equation. 10
- Q.3.      A) Draw and explain double ended and balanced output differential amplifier with the help of suitable equations.. 10  
            B) Explain the effects of coupling on performance of BJT. 10
- Q.4      A) Explain RC phase shift oscillator with the help of suitable diagram and equations. 10  
            B) Explain UJT relaxation oscillator with the help of suitable diagram and equations. 10
- Q.5.      A) Draw and explain N-channel FET with the help of suitable diagram and equations 10  
            B) Derive the expression for voltage gain, current gain, input impedance and output impedance of CE amplifier. 10
- Q.6. A) Write a short note on any TWO. 20  
            i) Full wave bridge rectifier with CLC filter.  
            ii) FET differential amplifier  
            iii) h-parameter model.



Con. 9824-14.

**QP Code : NP-18749**

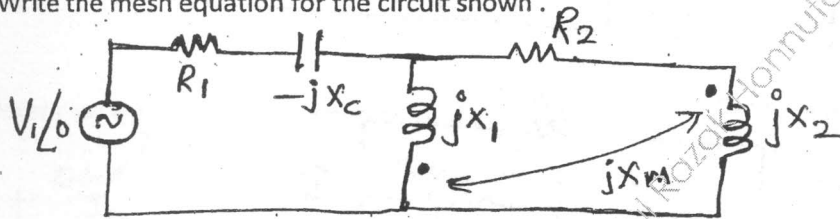
**(3 Hours)**

**[Total Marks : 80**

- Q. No. 1 is compulsory
- Solve any three from remaining Q. No. 2 to Q. No. 6
- Assume any suitable data if necessary

**Q. No. 1**

- a) What is network synthesis? Construct the circuit for  $Z(s) = 4s + \frac{9}{s} + \frac{15s}{s^2 + 4}$  [04]
- b) Derive the frequency domain equivalents for inductor with initial current  $i_0$  and capacitor with initial voltage  $v_0$ . [04]
- c) Write the mesh equation for the circuit shown. [04]



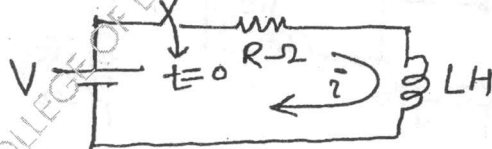
- d) How network functions are classified? State them for the n/w shown. [04]



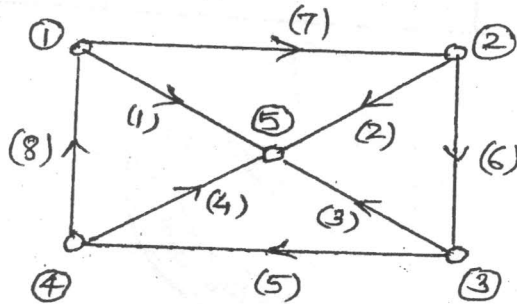
- e) Write a note on time constant of the circuit. [04]

**Q. No. 2**

- a) Discuss the order of the circuit. [04]
- b) For the circuit shown, determine  $i(t)$  for  $t \geq 0$  using classical method and also find  $i(\infty)$ . [06]

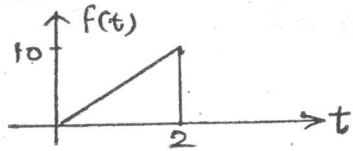


- c) Write incidence, f-tieset and f-cutset matrices for the graph shown. [10]

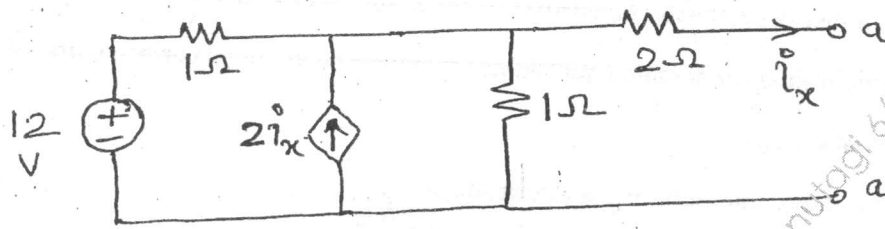


Q. No. 3

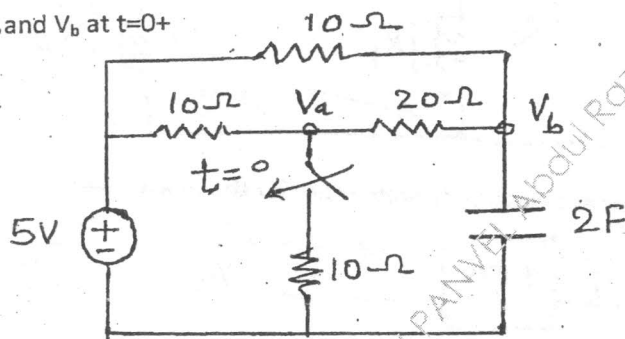
a) Determine the L.T. of the following wave shape. [05]



b) Calculate the Thevenin's voltage and Norton's current for the circuit shown [07]



c) Find  $V_a$  and  $V_b$  at  $t=0^+$  [08]

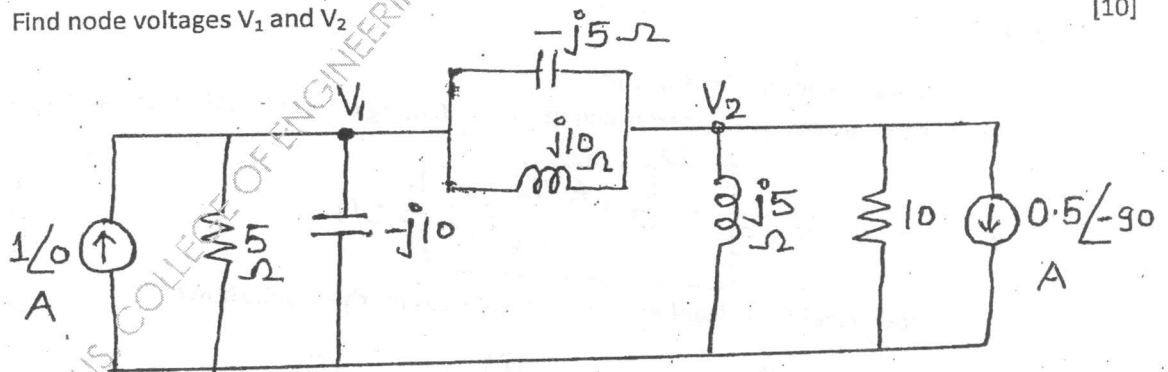


Q. No. 4

a) Check the polynomial  $P(s) = s^4 + 3s^2 + 2$  for Hurwitz. [06]

b) State network equilibrium equation on the basis of KVL and KCL. [04]

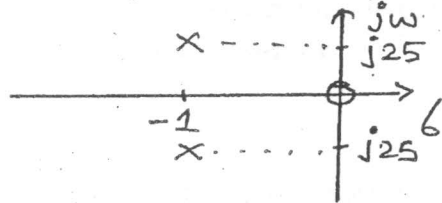
c) Find node voltages  $V_1$  and  $V_2$  [10]



[TURN OVER

Q. No. 5

- a) A series R-L-C circuit has a scale factor 5 for its driving point admittance and the p-z plot of the same is shown below, find the values of R, L and C. [10]

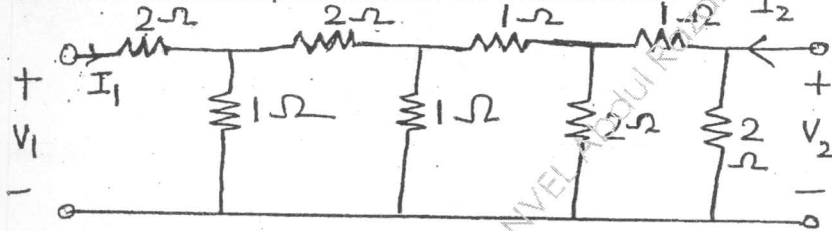


- b) Obtain cauer II form for  $Z(s) = \frac{s(s+4)(s+8)}{(s+1)(s+6)}$  [08]

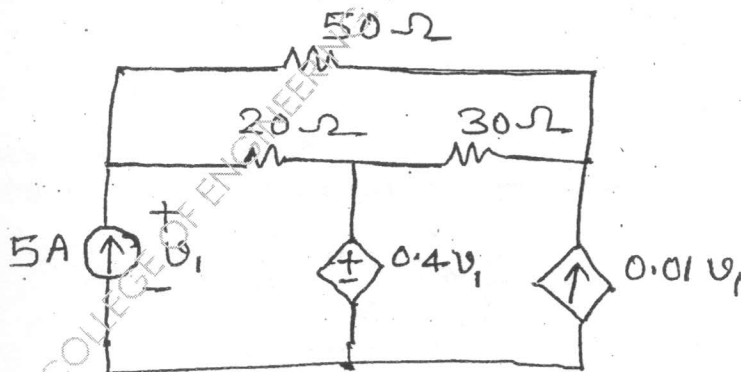
- c) Define Hybrid parameters [02]

Q. No. 6

- a) Determine transmission parameters for the network shown [12]



- b) Find power associated VCVS. [08]



**QP Code : NP-18749**

**(3 Hours)**

**[Total Marks : 80**

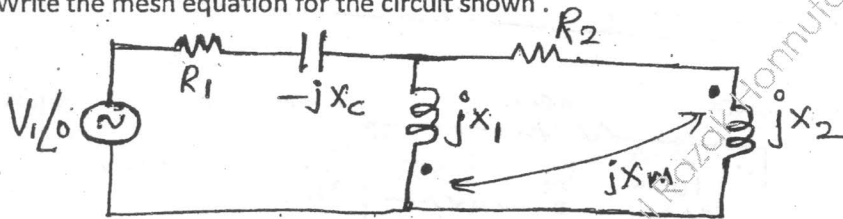
- Q. No. 1 is compulsory
- Solve any **three** from remaining Q. No. 2 to Q. No. 6
- Assume any suitable data if necessary

**Q. No. 1**

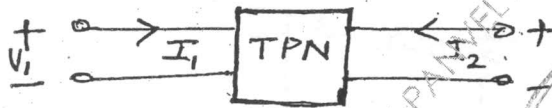
a) What is network synthesis? Construct the circuit for  $Z(s) = 4s + \frac{9}{s} + \frac{15s}{s^2 + 4}$  [04]

b) Derive the frequency domain equivalents for inductor with initial current  $i_0$  and capacitor with initial voltage  $v_0$ . [04]

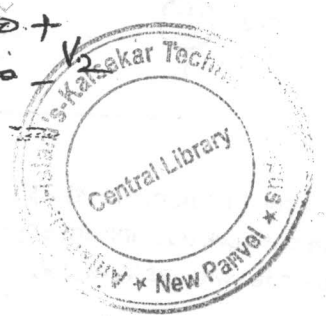
c) Write the mesh equation for the circuit shown. [04]



d) How network functions are classified? State them for the n/w shown. [04]



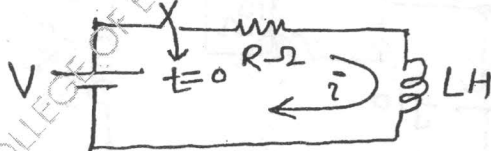
e) Write a note on time constant of the circuit. [04]



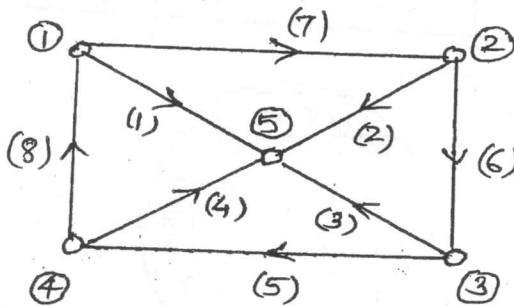
**Q. No. 2**

a) Discuss the order of the circuit. [04]

b) For the circuit shown, determine  $i(t)$  for  $t \geq 0$  using classical method and also find  $i(\infty)$ . [06]



c) Write incidence, f-tieset and f-cutset matrices for the graph shown. [10]

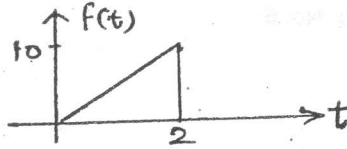


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Q. No. 3

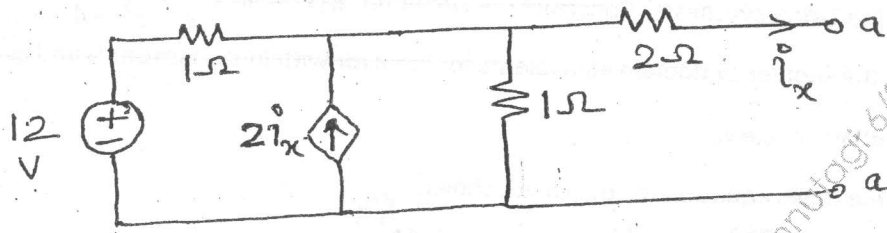
- a) Determine the L.T. of the following wave shape.

[05]



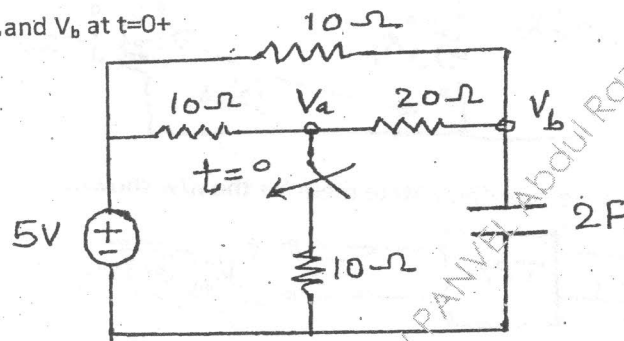
- b) Calculate the Thevenin's voltage and Norton's current for the circuit shown

[07]



- c) Find  $V_a$  and  $V_b$  at  $t=0^+$

[08]



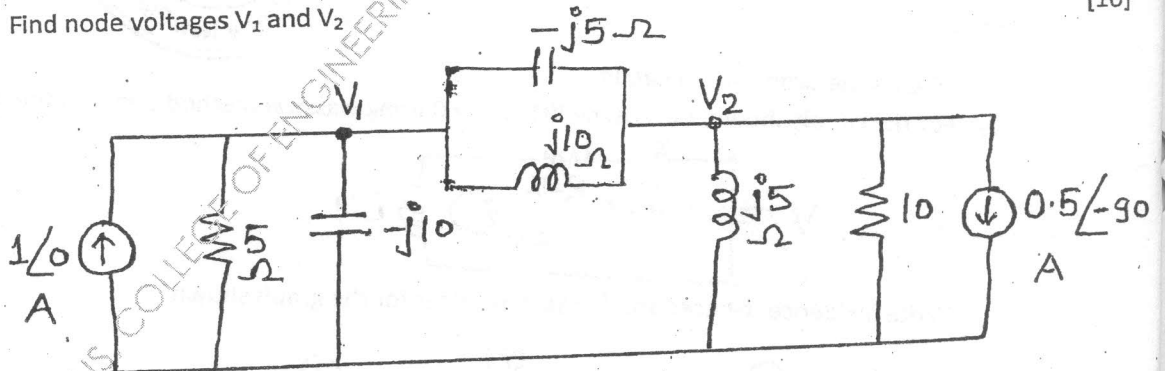
Q. No. 4

- a) Check the polynomial  $P(s) = s^4 + 3s^2 + 2$  for Hurwitz.  
 b) State network equilibrium equation on the basis of KVL and KCL.  
 c) Find node voltages  $V_1$  and  $V_2$

[06]

[04]

[10]

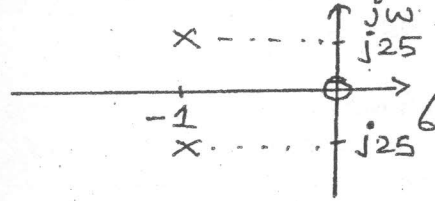


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Q. No. 5

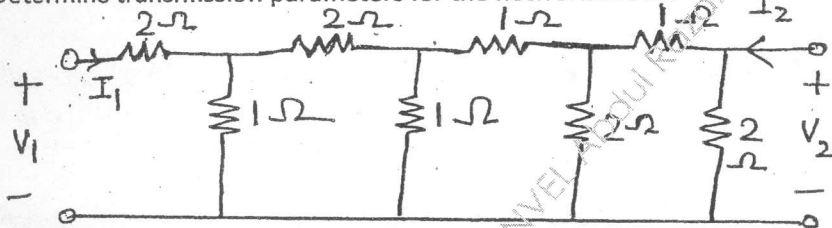
- a) A series R-L-C circuit has a scale factor 5 for its driving point admittance and the p-z plot of the same is shown below, find the values of R, L and C. [10]



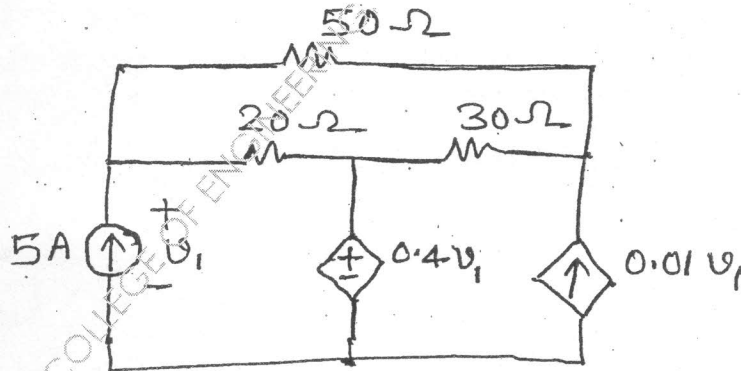
- b) Obtain cauer II form for  $Z(s) = \frac{s(s+4)(s+8)}{(s+1)(s+6)}$  [08]  
 c) Define Hybrid parameters [02]

Q. No. 6

- a) Determine transmission parameters for the network shown [12]



- b) Find power associated VCVS. [08]



Correction sheet is attached.

SE - Electrical & EXTC

Sem III - Rev

A.M. - III

22/5/14

QP Code : NP-18646

(3 Hours)

[ Total Marks : 80

N. B. : (1) Question No. 1 (one) is compulsory.

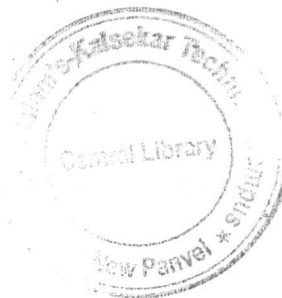
(2) Attempt any 3 (three) questions from the remaining questions.

(3) Assume suitable data, if necessary.

1. (a) Evaluate  $\int_0^{\infty} \frac{(\cos 6t - \cos 4t)}{t} dt$  5
- (b) Obtain complex form of fourier series for  $f(x) = e^{ax}$  in  $(-1, 1)$  5
- (c) Find the work done in moving a particle in a force field given by  $\vec{F} = 3xy\hat{i} - 5z\hat{j} + 10x\hat{k}$  along the curve  $x = t^2 + 1$ ,  $y = 2t^2$ ,  $z = t^3$  from  $t = 1$  to  $t = 2$ . 5
- (d) Find the orthogonal trajectory of the curves  $3x^2y + 2x^2 - y^3 - 2y^2 = \alpha$ , where  $\alpha$  is a constant. 5
2. (a) Evaluate  $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} - 3y = \sin t$ ,  $y(0) = 0$ ,  $y'(0) = 0$ , by Laplace transform 6
- (b) Show that  $J_{5/2} = \sqrt{\frac{2}{\pi x}} \left[ \frac{3-x^2}{x^2} \sin x - \frac{3}{x} \cos x \right]$  6
- (c) (i) Find the constants a, b, c so that  $\vec{F} = (x+2y+az)\hat{i} + (bx-3y-z)\hat{j} + (4x+(y+2z))\hat{k}$  is irrotational. 4
- (ii) Prove that the angle between two surfaces  $x^2 + y^2 + z^2 = 9$  and  $x^2 + y^2 - z = 3$  at the point  $(2, -1, 2)$  is  $\cos^{-1}\left(\frac{8}{3\sqrt{21}}\right)$  4
3. (a) Obtain the fourier series of  $f(x)$  given by 6
- $$f(x) = \begin{cases} 0 & -\pi \leq x \leq 0 \\ x^2 & 0 \leq x \leq \pi \end{cases}$$
- (b) Find the analytic function  $f(z) = u + iv$  where  $u = r^2 \cos 2\theta - r \cos \theta + 2$  6
- (c) Find Laplace transform of 8
- (i)  $te^{-3t} \cos 2t \cdot \cos 3t$
- (ii)  $\frac{d}{dt} \left[ \frac{\sin 3t}{t} \right]$

Con. 11456-14.

[ TURN OVER



4. (a) Evaluate  $\int J_3(x) dx$  and Express the result in terms of  $J_0$  and  $J_1$  6  
 (b) Find half range sine series for 6  
 $f(x) = \pi x - x^2$  in  $(0, \pi)$   
 Hence deduce that  $\frac{\pi^3}{32} = \frac{1}{12} - \frac{1}{3^2} + \frac{1}{5^2} - \frac{1}{7^2} + \dots$   
 (c) Find inverse Laplace transform of 8  
 (i)  $\frac{1}{s} \tanh^{-1}(s)$  (ii)  $\frac{se^{-2s}}{(s^2 + 2s + 2)}$
5. (a) Under the transformation  $w + 2i = z + \frac{1}{z}$ , show that the map of the circle  $|z| = 2$  is an ellipse in  $w$ -plane. 6  
 (b) Find half range cosine series of  $f(x) = \sin x$  in  $0 \leq x \leq \pi$ . 6  
 Hence deduce that  
 $\frac{1}{1.3} + \frac{1}{3.5} + \frac{1}{5.7} + \dots = \frac{1}{2}$   
 (c) Verify Green's theorem, for 8  
 $\oint_C (3x^2 - 8y^2) dx + (4y - 6xy) dy$  where  $C$  is boundary of the region defined by  $x=0$ ,  $y=0$ , and  $x+y = 1$ .
6. (a) Using convolution theorem; evaluate 6  
 $L^{-1} \left\{ \frac{1}{(s-1)(s^2+4)} \right\}$   
 (b) Find the bilinear transformation which maps the points 6  
 $z = 1, i, -1$  onto  $w = 0, 1, \infty$   
 (c) By using the appropriate theorem, Evaluate the following :- 8  
 (i)  $\int_C \bar{F} \cdot d\bar{r}$  where  $\bar{F} = (2x - y)\hat{i} - (yz^2)\hat{j} - (y^2z)\hat{k}$   
 and  $C$  is the boundary of the upper half of the sphere  $x^2 + y^2 + z^2 = 4$   
 (ii)  $\iiint_S (9x\hat{i} + 6y\hat{j} - 10z\hat{k}) \cdot d\bar{s}$  where  $S$  is  
 the surface of sphere with radius 2 units.

Con. 11456-14.



Course : S.E. (Sem. III) (CBSGS)

Q.P Code : NP-18646

Correction :

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Q2. (c) (i) Second line : read as

"F Bar =  $(x+2y+az)$  i cap +  $(bx - 3y - z)$  j cap +  $(4x + cy + 2z)$  k cap is irrotational"

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Q4. (b) Third line : Read as

"Right Hand Side of = sign, first term read as 1 by 1 square instead of 1 by 12"

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