

GATE 2014 – A Brief Analysis
 (Based on student test experiences in the stream of EE on 1st
 February, 2014 - Second Session)

Section wise analysis of the paper

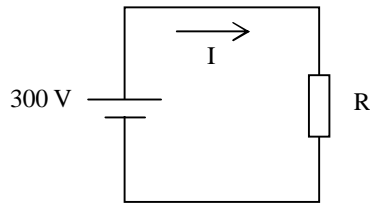
	1 Mark	2 Marks	Total No of Questions
Engineering Mathematics	2	3	5
Networks	2	2	4
Analog Circuits	1	2	3
Digital Circuits	1	2	3
Signals and Systems	6	4	10
Control Systems	2	3	5
Electrical Machines	3	3	6
Power Systems	2	6	8
Measurements	2	2	4
Power Electronics	2	2	4
Field Theory	2	1	3
Verbal Ability	2	2	4
Numerical Ability	3	3	6
	30	35	65

Types of questions asked from each section

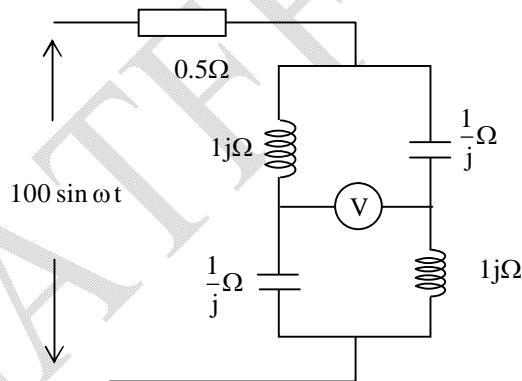
Engineering Mathematics	There were questions from Algebra, Vector Calculus, Differential Equations, Probability
Networks	Questions from basics concept
Analog Circuits	Questions from Amplifiers and Oscillator
Digital Circuits	Questions from Microprocessor
Signals and Systems	Questions from Fourier and Z Transform
Control Systems	Questions from Bode Plots, RH Criteria, Transfer Functions
Electrical Machines	Questions from Single Phase Transformer, DC Machines
Power Systems	Questions from Faulty Analysis, Economic Operation
Measurements	Questions from Measuring Instruments
Power Electronics	Questions from Choppers, Rectifiers
Field Theory	Questions from Electric Field and Potential

Questions from the Paper

1. In the given circuit if $R = \left(25 + \frac{I}{2}\right)$. Then $I =$ _____.



2. A 3- ϕ , 50 Hz, 6 pole motor has rotor resistance of 0.1Ω , reactance 0.92Ω . The slip at full load is 3%. Find the ratio of maximum torque to full load torque.
3. The incremental fuel costs of two generating plants are
 $C_1 = 0.05Pg_1^2 + APg_1 + B$
 $C_2 = 0.10Pg_2^2 + 3APg_2 + 2B$
 Where A, B are constants. Pg_1 and Pg_2 are power generated in plant 1 and 2. The two plants optimally share 1000 MW at an incremental cost of 100Rs/MWh. The ratio of $P_1 : P_2$ is _____.
4. In the following circuit the voltmeter reads _____ V.



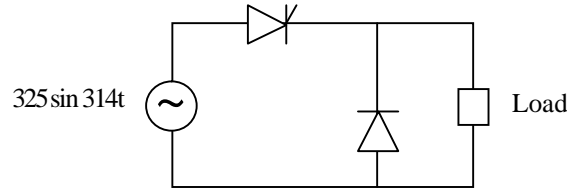
5. If $f(t)$ is continuous time signal, $f(\omega)$ is Fourier transform defined by

$$f(\omega) = \int_{-\infty}^{\infty} f(t)e^{-j\omega t} dt$$

$$g(t) = \int_{-\infty}^{\infty} F(u)e^{-jut} du$$

The relation between $f(t)$ and $g(t)$ is given by

6. A coin is tossed n times. The probability that difference between head and tail is $(n-3)$ is
 (A) $n_{C_{n-3}}$ (B) 2^{-n} (C) $n_{C_{n-3}} 2^{-n}$ (D) 0.
7. A rectifier circuit is shown below. The diode and thyristor are ideal. The load contains $R = 10\Omega$ and $L = 0.05H$. The firing angle ' α ' in degree to obtain a load voltage of 70 V is _____.



8. The line integral of function $\mathbf{F} = yz\mathbf{i}$ in anticlockwise direction along the circle $x^2 + y^2 = 1$ at $z=1$ is _____.
9. If $X(z) = \frac{1}{1-z^{-3}}$ be Z transform of causal signal $x(n)$, then values of $x(2)$, $x(3)$ are _____.

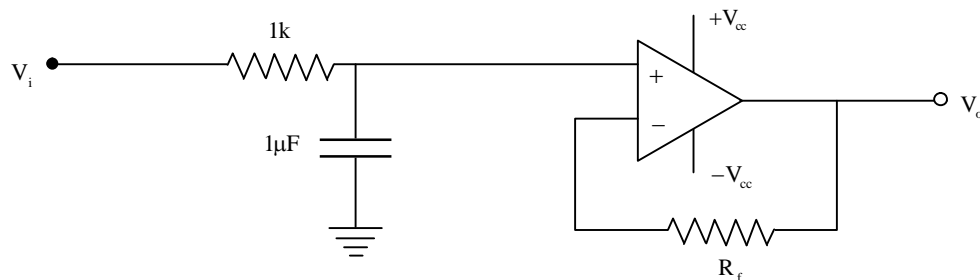
10. The matrix A is given as $A = \begin{bmatrix} 0 & 1 & -1 \\ -6 & -11 & 6 \\ -6 & -11 & 5 \end{bmatrix}$
 The ratio of maximum eigen value to minimum eigen value is _____.

11. Consider the K map shown below. Its realization is given by _____.

AB

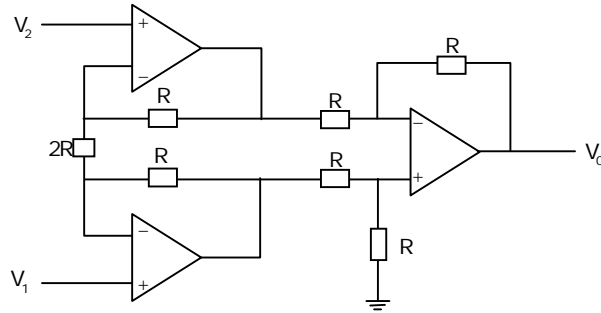
	00	01	11	10
0	1	1		
1		1	1	

12. Consider the circuit shown



The transfer function of $\frac{V_o(\omega)}{V_i(\omega)}$ gives bode plot as _____.

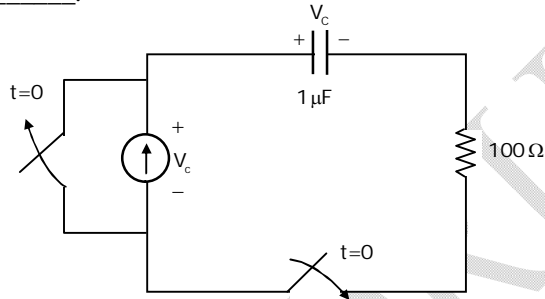
13.



The output V_0 is _____.

14.

Consider the circuit shown below. Given $V_C(0) = -2V$. The value of current in the circuit at $t=0$ is _____.



15.

A 8 pole, 3- ϕ , 50Hz inductor motor runs at a speed of 700 rpm. The frequency of rotor current of motor is _____.

16.

If $f(x) = xe^{-x}$, the maximum value of function in interval $(0, \infty)$ is

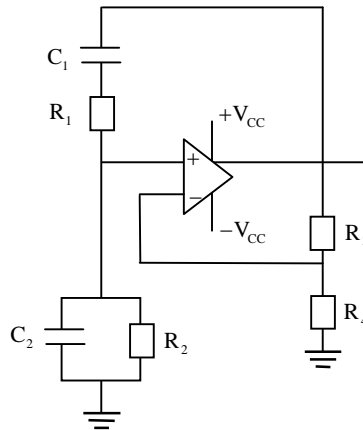
- (A) e^{-1} (B) e (C) $1 - e^{-1}$ (D) $1 + e^{-1}$

17.

Power consumed by a balanced 3- ϕ 3 wattmeter load is measured by two wattmeter method. The reading of wattmeter one is twice that of second. The load impedance in radians is given by _____.

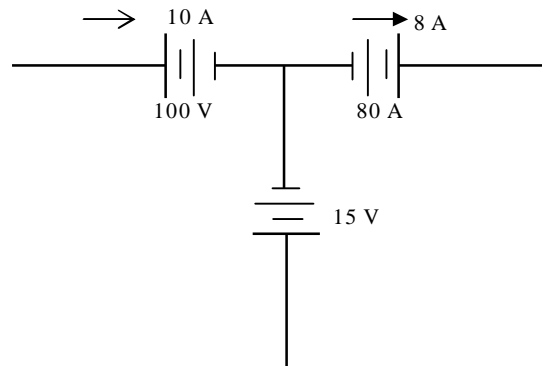
18.

A wien bridge oscillator is given below.



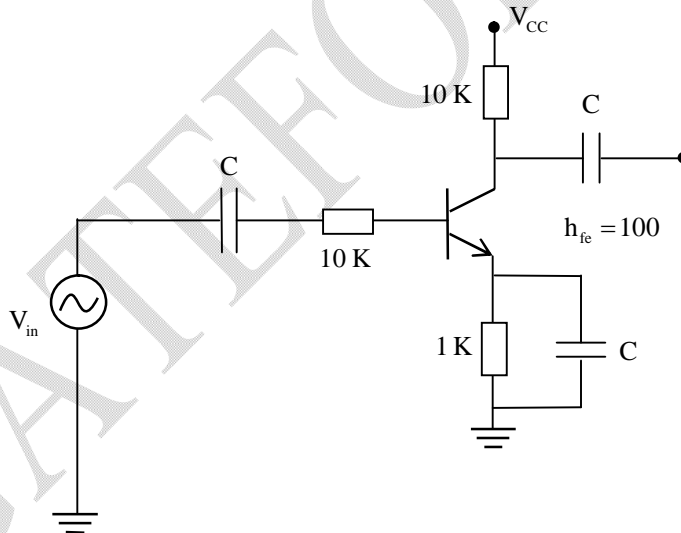
From the circuit the relation between R_3 & R_4 ; ω is given by.

19. In the figure shown power is transferred among all the three elements. The power absorbed by three elements is given by _____.



20. The solution in differential equation $\frac{d^2x}{dt^2} = -9x$ with initial condition $x(0)=1$ and $\left. \frac{dx}{dt} \right|_{t=0} = 1$ is given by _____.

21. Consider the circuit shown. The magnitude at mid band voltage gain is _____.



22. In RH criteria if all the elements in a row are zero's it indicates.
 (A) Roots lies on origin (B) Roots lies on positive real axis
 (C) Roots lie on imaginary axis (D) Roots lie on negative real axis.
23. If the roots of $ax^2 + bx + c$ are real and positive & a,b,c are real. Then $ax^2 + b|x| + c$ has
 (A) no roots (B) 2 roots (C) 3 roots (D) 4 roots.

24. If $\left(z + \frac{1}{z}\right)^2 = 98$, then $z^2 + \frac{1}{z^2} =$ _____.
25. In the press meet regarding the scam the minister said “the buck stops here”. What does the minister mean.
- (A) He will return the money.
(B) He will take the responsibility.
(C) Money does not matters.
(D) Stop the allegations.
26. In a tetrahedron with four triangular faces if a line is drawn connecting the corners of tetrahedron. The total number of planes will be _____.
27. In a survey, 300 people are asked whether they own a vehicle are not. And the result is shown below.
The percentage of people do not own a scooter is _____.

	Men	Women
Car	40	34
Scooter	30	20
Both	60	46
Don't own a vehicle	20	50