

PET-2017 (Electrical Engineering– Faculty of Engineering and Technology)

Roll No:

Date: **25 JUN 2017**

Signature of the Candidate:

1. Two identical coupled inductors are connected in series. The measured inductances for the two possible series connections are $380 \mu\text{H}$ and $240 \mu\text{H}$. Their mutual inductance in μH is _____
a) 620 b) 140 c) 35 d) 70
2. In an RLC series circuit, the impedance at resonance is
a) Maximum b) Minimum c) Infinity d) Zero
3. Regarding Thevenin equivalent, which of the following is not correct:
a) The voltage source in the Thevenin equivalent circuit is the open circuit voltage of the network when load is disconnected
b) The Thevenin equivalent resistance (impedance) is the resistance (impedance) of the network when all voltage sources are short circuited
 c) Thevenin equivalent resistance is calculated when all voltage sources are open circuited
d) Thevenin equivalent is the voltage equivalent of the network
4. The "Superposition theorem" is essentially based on the concept of
a) Duality b) Linearity c) Reciprocity d) Non-Linearity
5. Which of the following motors has a high starting torque?
a) AC series motor b) DC series motor c) Induction motor d) Synchronous motor
6. The effect of increasing the length of the air gap in an induction motor will be to increase
a) Power factor b) Speed c) Magnetizing Current d) Air gap flux
7. The efficiency of a transformer is maximum when
a) It runs at half full load
b) It runs at full load
 c) Its Cu loss equals Iron loss
d) It runs overload



8. Reduction in the capacitance of capacitor- start motor results in reduced

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- a) Noise b) Speed c) Starting Torque d) Armature Reaction

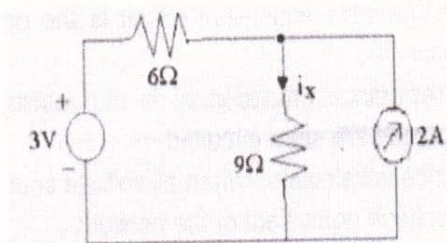
9. Surface integral of the electrical field intensity is the

- a) Net flux emanating from the surface
b) Electric charge
c) Charge density
d) Flux density

10. Which law is synonymous to the occurrence of diamagnetism?

- a) Ampere's law
b) Maxwell's law
c) Coulomb's law
 d) Lenz's law

11. The current i_x in the network is



- a) 1 A b) $\frac{3}{4}$ A c) $\frac{1}{2}$ A d) 2 A

12. In Routh Hurwitz Criterion, if all the elements in one row are zero, then there are

- a) Pairs of equal roots with opposite sign
b) Pairs of conjugate roots on imaginary axis
c) Conjugate roots forming a quadrate in the s-plane
 d) All of these

13. Phase margin of a system is used to specify

- a) Relative stability
b) Absolute stability
c) Time response
d) Frequency response



14. The transfer function of a unity feedback system is

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$$\frac{2s^2 + 6s + 5}{(s+2)(s+1)^2}$$

The characteristic equation of the system is

- a) $2s^2 + 6s + 5 = 0$
- b) $(s+2)(s+1)^2 = 0$
- c) $2s^2 + 6s + 5 + (s+2)(s+1)^2 = 0$
- d) $2s^2 + 6s + 5 - (s+2)(s+1)^2 = 0$

15. Derivative control

- a) Has the same effect as output rate control
- b) Reduce damping
- c) Is predictive in nature
- d) Increases the order of the system

16. For the transfer function

$$G(s)H(s) = \frac{1}{s(s+1)(s+0.5)}$$

The phase cross over frequency is

- a) 0.5 rad/sec
- b) 0.707 rad/sec
- c) 1.732 rad/sec
- d) 2 rad/sec

17. Shunt reactors are sometimes used in high voltage transmission system to

- a) Limit the short circuit current through the line
- b) Compensate for the series reactance of the line under heavily loaded condition
- c) Limit over-voltages at the load side under lightly loaded condition
- d) Compensate for the voltage drop in the line under heavily loaded condition

18. It is preferable to use a train of pulse of high frequency for gate triggering of SCR in order to reduce

- a) dv/dt problem
- b) di/dt problem
- c) The size of the pulse transformer
- d) The complexity of the firing circuits



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19. In the thyristor anode current is made up of

- a) Electrons only
- b) Electrons or holes
- c) Electrons and holes
- d) Holes only

20. A converter which can operate in both 3-phase and 6 pulse mode is a

- a) 1-phase full converter
- b) 3-phase half wave converter
- c) 3-phase semi converter
- d) 3-phase full converter

21. The depletion-mode MOSFET

- a) Can operate with only positive gate voltages
- b) Can operate with only negative gate voltages
- c) Cannot operate in the ohmic region
- d) Can operate with positive as well as negative gate voltages

22. Moving iron instruments can be used on

- a) AC and DC both
- b) AC only
- c) DC only
- d) Half wave rectified AC

23. The meter constant of energy meter is given by

- a) rev./kW
- b) rev./kWh
- c) rev./watt
- d) kWh/rev.

24. Hysteresis in a measuring instrument implies

- a) Repeatability of the instrument
- b) Reliability of the instrument
- c) Change in reading at the same value when input is first increased and then decreased
- d) Inaccuracy due to change in temperature

25. A signal of 10mV at 75 MHz is to be measured with which of the following instruments

- a) VTVM
- b) CRO
- c) Moving iron voltmeter
- d) Digital multimeter



26. Which of the following buses is primarily used to carry signals that direct other ICs to find out what type of operation is being performed?

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- a) Data bus
- b) Control bus
- c) Address bus
- d) Address decoder bus

27. A register in the microprocessor that keeps track of the answer or results of any arithmetic or logic operation is the:

- a) Stack pointer
- b) Program counter
- c) Instruction pointer
- d) Accumulator

28. The range of an 8-bit two's complement word is from:

- a) $+128_{10}$ to -128_{10}
- b) -128_{10} to $+127_{10}$
- c) $+128_{10}$ to -127_{10}
- d) $+127_{10}$ to -127_{10}

29. Two alternating quantities are added

- a) Arithmetically
- b) Graphically
- c) Vectorially
- d) Geometrically

30. In a magnetic circuit, eddy current loss is proportional to

- a) f
- b) $1/f$
- c) f^2
- d) $1/f^2$

Which f is the frequency of reversal of magnetisation

31. The use of capacitor filter in rectifier circuit gives satisfactory performance only when the load

- a) Current is high
- b) Current is low
- c) Voltage is low
- d) Voltage is high



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32. For a fixed value of complex power flow in a transmission line having a sending end voltage as V , the real power loss will be proportional to

- a) V
- b) $1/V$
- c) V^2
- d) $1/V^2$

33. The transmission line distance protection relay having the property of being inherently directional is

- a) Impedance relay
- b) Mho relay
- c) Ohm relay
- d) Reactance relay

34. For harnessing low variable water head, the suitable hydraulic turbine with high percentage of reaction and runner adjustable vane is

- a) Kaplan
- b) Francis
- c) Pelton
- d) Impeller

35. A 440V, 50Hz, three phase balanced source supplies power to a star connected load whose rating is 12KVA. 0.8 lagging pf. The rating of capacitive bank to bring it to unity pf is

- a) 7.2 KVAR
- b) 12 KVAR
- c) 9.6 KVAR
- d) 10 KVAR

36. Divergence is zero for

- a) Electric flux density
- b) Magnetic flux density
- c) Both for electric and magnetic flux density
- d) None of these

37. The RMS value for the voltage $v(t)=3 + 4 \cos 3t$ is

- a) 4.11
- b) 5.828
- c) 5
- d) 7



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38. The period of signal $x(t) = 5 \sin (0.8\pi t + \pi/4)$

- a) 0.4 sec.
- b) 0.4π sec.
- c) 1.25 sec.
- d) 2.5 sec.

39. Transient current in a circuit results from

- a) Voltage applied to the circuit
- b) Impedance of the circuit
- c) Resistance of the circuit
- d) Changes in the stored energy in inductors and capacitors

40. Inductance is measured by

- a) Wein bridge
- b) Schering bridge
- c) Maxwell bridge
- d) Hay bridge

