

Part-I Electrical Engineering

- 1) Poynting vector has units of :-
 a) watts per metre
 b) watts per metre²
 c) newton
 d) newton per metre

2) The negative sign in the expression $e = -N.d\Phi / dt$ volts, is explained by :-
 a) Lenz's law
 b) Fleming left hand rule
 c) Fleming right hand rule
 d) Tellegen's theorem

3) The electromagnetic torque developed in a cylindrical rotor synchronous motor is proportional to (d= the power angle) :-
 a) $1/d$
 b) d
 c) $\cos d$
 d) $\sin d$

4) A 220 kV/132 kV transformer has impedance on 132 kV side equal to 0.0729 per unit and angle 78.13 degree. Its impedance on 220 kV side is :-
 a) $(220/132)^2 \times 0.0729$ pu angle 78.13°
 b) $(132/220)^2 \times 0.0729$ pu angle 78.13°
 c) 0.0729 pu angle 78.13°
 d) $(220/132) \times 0.0729$ pu angle 78.13°

5) Bundle conductor transmission lines :-
 a) protect the phase conductors against lightning
 b) enhance the string efficiency of disc insulator
 c) enhance the capacity of string insulator
 d) decreases the voltage gradient at the conductor surface

6) The short lines less than 80 km long, the loadability is limited by :-
 a) stability consideration
 b) voltage drop
 c) voltage regulation
 d) thermal limit

7) The fast power flow algorithms are based on the two sets of decoupled equations :-
 a) $(\partial P/\partial \delta)_v \Delta \delta = \Delta P$ and $(\partial Q/\partial V)_v \Delta V = \Delta Q$
 b) $(\partial P/\partial V)_\delta \Delta \delta = \Delta P$ and $(\partial Q/\partial V)_\delta \Delta V = \Delta Q$
 c) $(\partial P/\partial \delta)_v = \Delta Q$ and $(\partial P/\partial V)_v = \Delta P$
 d) $(\partial P/\partial \delta)_\delta \Delta V = \Delta P$ and $(\partial Q/\partial V)_\delta \Delta \delta = \Delta Q$

8) If the fault current is 4000 A, the relay setting 100% and C.T. ratio is 400/5, then the plug setting multiplier will be :-
 a) 10
 b) 20
 c) 25
 d) 50

9) The initial slope of the Bode plot for a transfer function having double zero at origin is :-
 a) 20 db /decade
 b) - 20 db /decade
 c) 40 db /decade
 d) - 40 db /decade

10) The power factor of a delta connected 3 phase, 50 kW, induction motor is 0.4 when delivering 35% of its rated load. If its stator is reconnected in star with the same load on the shaft, then its :-
 a) pf is improved, stator current decreases
 b) pf is improved, stator current increases
 c) pf is worsened, stator current increases
 d) pf remains unchanged, stator current decreases

- 11) In a GTO based chopper circuit, to turn on the GTO, the current required at the gate terminal is 5mA. The current required at the gate terminal for turning off the device is
 a) same as the turn on current but with a (-)ve sign
 b) less than the turn on current but with a (-)ve sign
 c) much higher than the turn on current with a (-)ve sign
 d) none of the above
- 12) A square wave type voltage of peak magnitude 100 V is measured by a moving iron voltmeter. It will read :-
 a) 200 V b) 50 V c) 100 V d) 400 V
- 13) The phase shifting transformer is used in conjunction with a / an :-
 a) Drysdale potentiometer b) ac coordinate potentiometer
 c) Crompton potentiometer d) Simple Larsen potentiometer
- 14) A 10-bit A/D convertor is used to digitalise an analog signal in the 0 to 5 V range. The resolution of the ADC is :-
 a) nearly 100 mV b) nearly 50 mV
 c) nearly 25 mV d) nearly 5 mV
- 15) A digital voltmeter has 4 and a $\frac{1}{2}$ digit display. The 2 V range can read upto :-
 a) 1.000 b) 1.111 c) 1.9999 d) 1999
- 16) The effect of source inductance on performance of single phase and 3 phase full converters is to :-
 a) reduce the ripples in the load current b) make discontinuous current as continuous
 c) reduce the output voltage d) increase the load voltage
- 17) In case of HVDC links, the pf of the converter on dc side is given as :-
 a) $\cos \varphi = \{\cos \alpha + \cos(\alpha + y)\}/2$ b) $\cos \varphi = \cos(\alpha + y)/2$
 c) $\cos \varphi = \cos(\alpha + y)/2$ d) $\cos \varphi = \{\cos \alpha\}/2$
 where α is the firing angle or control angle and y is the extinction angle.
- 18) A thristor can be termed as :-
 a) DC switch b) AC switch c) either (a) or (b) d) neither (a) or (b)
- 19) A Tesla coil is a :-
 a) cascaded transformer b) coreless transformer
 c) high frequency resonant transformer d) low impedance transformer
- 20) A good differential amplifier has a :-
 a) high input signals b) low common mode rejection ratio
 c) high common mode rejection ratio d) low input signals
- 21) Which of the following power plant can be installed close to load center :-
 a) Hydroelectric power plant b) Steam power plant
 c) Diesel power plant d) Nuclear power plant
- 22) Safety valve generally used on high pressure boiler is :-
 a) Dead weight type b) Lever type
 c) Spring type d) Any of the above

- 23) Cavitation is caused by :-
 a) Fluid velocities b) Low pressure
 c) High pressure d) Low fluid velocities

24) Which of the following turbine is different from the remaining :-
 a) Propeller turbine b) Francis turbine
 c) Pelton wheel d) Kaplan turbine

25) Power plants using coal work closely on known which of the following cycle :-
 a) Otto cycle b) Rankine cycle
 c) Binary vapour cycle d) Brayton cycle

26) The efficiency of a thermal power plant improves with :-
 a) use of high steam pressures b) increased quantity of coal burnt
 c) larger quantity of water used d) lower load in the plant

27) Reflectors of nuclear reactors are made of :-
 a) Cast iron b) Beryllium c) Steel d) Boron

28) ACANDU reactor uses :-
 a) Highly enriched Uranium as fuel and light water as moderator and coolant.
 b) Natural Uranium as fuel and heavy water as moderator and coolant.
 c) Highly enriched Uranium as fuel and ordinary water as moderator and coolant.
 d) only ferrite material.

29) Arc in a circuit behaves as :-
 a) A capacitive reactance
 b) An inductive reactance
 c) A resistance increasing with voltage rise across the arc
 d) A resistance decreasing with voltage rise across the arc

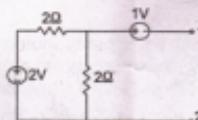
30) If the two generators have individual ratings of 10 MW each (let them be A and B, with A having a higher efficiency), a system load of 16 MW should be shared as :-
 a) 8 MW on each generator b) 10 MW on A and 6 MW on B
 c) 10 MW on B and 6 MW on A d) 9 MW on A and 7 MW on B

31) Insulators for high voltage applications are tested for :-
 a) power frequency tests b) impulse tests
 c) both (a) and (b) above d) none of the above

32) The gap length of Rod type surge diverter used for 132 kV line should be :-
 a) 10 cm b) 15 cm c) 50 cm d) 65 cm

33) Moles Bridge is used to measure :-
 a) Properties of dielectric at dc b) Dispersion in insulation
 c) High frequency high voltages d) Modulation ratio frequencies

34) Test sources required for testing power apparatus of 220 kV, 3-phase ac systems are :-
 a) 500 kV ac, 1 MV impulse b) 800 kV impulse
 c) 300 kV ac, 500 kV impulse d) 250 kVA, 500 kV impulse



- 42) For the block diagram shown in the figure the transfer function $C(s)/R(s)$ is equal to :-



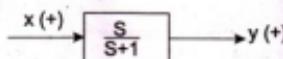
a) $\frac{(s^2 + 1)}{s}$

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

b) $(s^2 + s + 1)$

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

- 43) For the system shown in figure, if the input $x(t) = \sin t$, in the steady state, the response $y(t)$ will be :-



- a) $1/\sqrt{2} \sin(t - 45^\circ)$
 c) $\sin(t - 45^\circ)$
- b) $1/\sqrt{2} \sin(t + 45^\circ)$
 d) $\sin(t + 45^\circ)$
- 44) Transposition of conductors are done in transmission lines to :-
 a) reduce line loss
 b) reduce skin effect
 c) balance line drop
 d) reduce Ferranti effect
- 45) The top most conductor in HV transmission systems is the :-
 a) R phase conductor
 b) Y phase conductor
 c) B phase conductor
 d) earth conductor
- 46) The instantaneous voltage and current across a load is given by $v = 100 \sin(314t - \pi/6)$ volts and $i = 10 \sin(314t - \pi/2)$ amperes, respectively. The active power consumed by the load is:
 a) 500 watts
 b) 125 watts
 c) 1000 watts
 d) none of the above
- 47) Which logic circuit is the fastest :-
 a) TTL
 b) DTL
 c) RTL
 d) All have same speed
- 48) The 100110₂ is equivalent to :-
 a) 26₁₆ b) 36₁₀ c) 45₈ d) 213₄
- 49) In a centre tapped transformer, single phase diode full wave rectifier the input voltage is 230 V(rms) single phase AC. If the secondary winding has 50-0-50 V tapping, then the peak reverse voltage across the diodes will be :-
 a) $100\sqrt{2}$ V b) 100 V c) $50\sqrt{2}$ V d) 50 V
- 50) Ripple in output current of a step-down chopper feeding RLE load is maximum, when duty cycle is equal to :-
 a) 1 b) 0.5 c) 0.75 d) 0.33
- 51) An over current relay of current rating 5A and setting 150% is connected to the secondary of CT ration of 300 : 5, then the current in the lines for which the relay pick up is :-
 a) 300 Amps b) 450 Amps c) 150 Amps d) 200 Amps

- 52) For reliable speed operation of a separately excited DC motor drive in all the four quadrants of the speed-torque plane, the converter to be used is :-
 a) half controlled converter
 b) fully controlled converter
 c) uncontrolled converter
 d) dual converter
- 53) The plug setting of a negative sequence relay is 0.2 A. The CT ratio is 5 : 1. The minimum value of line to line fault current for the operation of the relay is :-
 a) 1 A b) 1/1.732 A c) 1.732 A d) 0.2/1.732 A
- 54) In a power station, the cost of generation of power reduces most effectively when :-
 a) diversity factor alone increases
 b) both diversity factor and load factor increases
 c) load factor alone increases
 d) both diversity factor and load factor decreases
- 55) During reconditioning of transformer oil it is economical to use electrostatic filters if the water content of oil is :-
 a) greater than 2 ppm b) less than 2 ppm
 c) greater than 4 ppm d) less than 4 ppm
- 56) The most serious problem in vacuum circuit breaker is :-
 a) poor arc quenching b) low thermal stability
 c) low thermal conductivity d) current chopping
- 57) The leakage reactance voltage drop in a transformer depends upon the :-
 a) applied voltage b) frequency
 c) load current d) mutual flux
- 58) In a normal 3 phase slip - ring asynchronous motor the developed starting torque will :-
 a) increase with the increase in the value of the rotor resistance
 b) decrease with the increase in the value of the rotor resistance
 c) not depend upon the value of the rotor resistance
 d) increases with increase in the value of rotor resistance upto a certain value and then decrease with further increase in rotor resistance.
- 59) How is the reactive power delivered by a synchronous generator controlled :-
 a) by changing the prime mover input b) by changing the excitation
 c) by changing the direction of rotation d) by changing the prime mover speed
- 60) In the case of power measurement by two wattmeter method in a balanced 3 phase system with a purely inductive load :-
 a) both the wattmeters will indicate the same value with same sign
 b) both the wattmeters will indicate the same value with opposite sign
 c) both the wattmeters will indicate zero
 d) one wattmeter will indicate zero and the other will indicate some non zero value

PART-II GENERAL KNOWLEDGE / AWARENESS, REASONING AND ENGLISH

- 61) National Gallery of Modern Art and Museum is in :-
 a) Lucknow b) Kolkata c) Hyderabad d) New Delhi
- 62) Which of the following term is associated with chess :-
 a) Pitcher b) Deuce c) Vulnerable d) Gambit
- 63) Which was the first metal used by man :-
 a) Copper b) Silver c) Bronze d) Brass
- 64) Who won the men's single title in French Open Tennis Championship 2013 :-
 a) Rafael Nadal b) David Ferrer
 c) Roger Federer d) Novak Djokovic
- 65) The rechargeable battery used in a mobile phone hand set is usually :-
 a) Lithium ion battery b) Zinc ion battery
 c) Magnesium ion battery d) Copper ion battery
- 66) "Stapes" is the smallest _____ in the human body.
 a) Muscle b) Tissue c) Bone d) Cell
- 67) One barrel of oil is approximately equal to :-
 a) 159 liters b) 321 liters c) 257 liters d) 131 liters
- 68) Bearer cheque is a cheque that is payable to :-
 a) A person whosoever presents it to the banker. b) Only to the named person.
 c) Only to the account holder. d) None of the above
- 69) Tip of South America is :-
 a) Cape Verde b) Cape York c) Cape Horn d) Cape Cod
- 70) Where is the headquarters of World Bank ?
 a) Washington b) Paris c) Geneva d) Rome
- 71) What would come next in the following series :-
 A₁₅, D₁₅, G₂₀, J₂₅, _____.
 a) N₁₈ b) M₁₆ c) O₂₀ d) None of the above
- 72) Complete the series 1, 2, 3, 6, 11, 20, 37, 68, ?
 a) 125 b) 124 c) 126 d) 105

- 73) In how many ways can 9 different envelopes be posted into 4 different letter boxes : -
 a) 9^4 b) 4^9 c) 36 d) 64
- 74) If in a certain code YELLOW is written as XFKMNX, how is COUNTRY coded?
 a) DQXPWSZ b) BPTMSSX c) BNTMSQX d) DPVOSQX
- 75) Book : Bookcase :: Clothes : ?
 a) Rack b) Press c) Wardrobe d) Naphthalene Balls
- 76) If 7th of the month falls two days preceding Sunday, what day of the week will follow the 27th of the month : -
 a) Friday b) Saturday c) Thursday d) Monday
- 77) Write a single letter, which when prefixed to the following words forms new words : -
 WORD, INK, TRAP, LAP
 a) L b) C c) S d) F
- 78) Find the set of numbers similar to the set in question : -
 Given Set : (6, 13, 22)
 a) (6, 13, 27) b) (10, 16, 28) c) (11, 18, 27) d) (13, 19, 22)
- 79) Choose the word which is least like the other words in the group : -
 a) Book b) Pencil c) Pen d) Sharpener
- 80) In a certain language SIKKIM is coded as THLJJL, then TRAINING is written as : -
 a) SQBHOHOH b) UQBHOHOF c) UQBJOHHO d) UQBJOHOH
- (Q 81 - 85) Choose the correct alternative out of the given options**
- 81) The crowd bade the _____ of ships farewell.
 a) Fleet b) Band c) Herd d) Crew
- 82) When he came, he was in a _____ mood.
 a) Playing b) Playfully c) Playful d) Played
- 83) Make hay _____ the sun shines.
 a) when b) as c) because d) while
- 84) I complimented him _____ his brilliant success in the examination.
 a) over b) for c) to d) on
- 85) Mohini resembles _____ her mother.
 a) with b) after
 c) to d) no preposition is needed
- Directions (Q 86- 90) : find out the antonyms for the underlined word.**
- 86) It was raining awful on Saturday night.
 a) appalling b) lovely c) horrible d) terrible

- 87) His way of presentation is **unique**.
 a) exclusive b) rare c) ✓ common d) matchless
- 88) The laws are made to be **enforced**.
 a) imposed b) compulsory c) obligatory d) ✓ none of the above
- 89) My proposal was **cast off** in the meeting.
 a) ✓ accepted b) discarded c) rejected d) unwanted
- 90) **Exclusive**
 a) Laudable b) ✓ Desirable c) Liability d) ✓ Inclusive

Directions (Q 91 – 93) : Choose the correct synonyms out of the four given alternatives against each of the following :-

- 91) **BERSERK**
 a) Mad b) Bestial c) ✓ Placid d) Berth
- 92) **IMMENSE**
 a) Tiny b) ✓ Huge c) Imposing d) Important
- 93) **TREMENDOUS**
 a) Fearful b) ✓ Much c) Horrible d) Great
- 94) Find the wrongly spelt word from the following :-
 a) Repudiate b) Felicitous c) Sollicitous d) Digression
- 95) Mark the odd one out :-
 a) Permanent b) Infinite c) Perdurable d) ✓ Fragile

Directions (Q 96 – 97) : Choose right option from the following sentences.

- 96) He was praised by his father.
 a) His father was praised by him. b) His father was praising him.
 c) His father did praising him. d) ✓ His father praised him.
- 97) The teacher said, "I am busy now".
 a) The teacher said that I am busy now. b) ✓ The teacher said that he is busy now.
 c) The teacher said that he is busy then. d) The teacher said that he was busy then.
- 98) Find the sentence in which the underlined word is used as VERB.
 a) I have a European **guide**. b) ✓ Good parents **guide** their children.
 c) Where is the tour **guide**. d) We are in a **guides** camp.

Directions (Q 99 – 100) : In the following questions, change the Nouns into Verb.

- 99) Entrance
 a) Entry b) Entertain c) ✓ Enter d) Entrant
- 100) Isolation
 a) Isolating b) ✓ Isolate c) Isolative d) Isolatingly