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BMC Dy. Executive Engineerb (Electric /Mechanical) (BMC/202122/6) Question Paper (26-09-2021) Series C
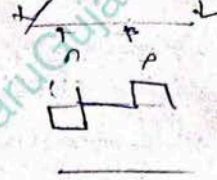
1. The positive logic OR gate is the same as negative logic _____.

   (A) EX-OR gate

   (B) OR gate

   (C) NOR gate

   (D) AND gate

2. In single phase ac voltage controller feeding a resistive load, the average current over one full cycle _____.

   (A) is always zero

   (B) cannot be zero

   (C) may be some times zero

   (D) is always positive

3. It is desirable to eliminate 5th harmonic voltage from the phase voltage of an alternator. The coils should be short-piched by an electrical angle of _____.

   (A) 30 degree

   (B) 36 degree

   (C) 18 degree

   (D) 72 degree

4. The peak factor is the ratio of _____.

   (A) average value to rms value

   (B) rms value to average value

   (C) peak value to rms value

   (D) peak value to average value

5. Which of the following converter circuits would require a neutral point ?

   (A) 3-phase semi-converter

   (B) 3-phase full converter

   (C) 3-phase full converter with freewheeling diode

   (D) 3-phase half wave converter

6. When the nut is tightened by placing a washer below it, the bolt will be subjected to _____.

   (A) tensile stress

   (B) compression stress

   (C) shear stress

   (D) bending stress

7. The deformation of a bar under its own weight as compared to that when subjected to a direct axial load equal to its own weight will be _____.

   (A) the same

   (B) one fourth

   (C) half

   (D) double

[6-C-2]

8. The simply supported beam has equal overhanging lengths and carries equal concentrated loads P at ends. Bending moment over the length between the supports _____.

   (A)   is zero

   (B)   is a non - zero constant

   (C)   varies uniformly from one support to the other

   (D)   is maximum at mid span

9. The more effective way to increase the thermal efficiency of a carnot cycle is to :

   (A)   Increase the source temperature

   (B)   Decrease the sink temperature

   (C)   Increase the sink temperature

   (D)   Decrease the source temperature

10. The efficiency of a power transformer is maximum at _____.

   (A)   Nearly full load

   (B)   1/2 full load

   (C)   1/4 full load

   (D)   1/8 full load

11. Which semiconductor device out of the following is not a current triggered device ?

   (A)   Thyristor

   (B)   TRIAC

   (C)   GTO

   (D)   MOSFET

12. Which one of the following decreases porosity of law carbon steel ?

   (A)   Sulphur

   (B)   Phosphorus

   (C)   Manganese

   (D)   Silicone

13. Pearlite phase in an iron-carbide phase diagram is _____.

   (A)   Eutectic phase

   (B)   Hypo-eutectic mixture

   (C)   Eutectoidal mixture

   (D)   Hyper- eutectic phase

14. If the damping ration of the system is zero then it is called as _____.

   (A)   critically damped system

   (B)   undamped system

   (C)   under damped system

   (D)   over damped system

[6-C-3]

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15. A long helical spring having a spring stiffness of 12 kN/m and number of turns 20, breaks into two parts then stiffness of the resultant spring will be _____.

(A)   6 kN/m

(B)   12 kN/m

(C)   24 kN/m

(D)   30 kN/m

16. Auto frettage is the method of _____.

(A)   joining thick cylinders

(B)   calculating stresses in thick cylinders

(C)   prestressing thick cylinders

(D)   increasing the life of thick cylinders

17. Starting torque of an induction motor is proportional to _____.

(A)   Supply Voltage

(B)   (Supply voltage)^2

(C)   1/2 (Supply voltage)

(D)   (Supply Voltage)^3

18. The range of a moving iron a.c. ammeter is extended by _____.

(A)   a shunt

(B)   a multiplier

(C)   changing number of turns of operating coil

(D)   changing material of indicator

19. In a slider-bar mechanism, when does the connecting rod have zero angular velocity ?

(A)   When crank angle = 0°

(B)   When crank angle = 90°

(C)   When crank angle = 45°

(D)   Never

20. Coriolis component of acceleration depends on...

1.   angular velocity of the link

2.   acceleration of the slider

3.   angular acceleration of the link

Which of the above is/are correct ?

(A)   1 only

(B)   2 only

(C)   1 and 3

(D)   2 and 3

[6-C-4]

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21. Free wheeling diode in a converter is placed _____.

(A) in shunt with thyristor

(B) across the DC load

(C) In series with thyristor

(D) in series with load

22. Large field guns which come to initial position after firing in shortest possible time are _____.

(A) Under damped

(B) Critically damped

(C) Over damped

(D) Undamped

23. Distribution transformers are designed to have maximum efficiency nearly at _____ of full load

(A) 70%

(B) 100%

(C) 25%

(D) 50%

24. The leakage reactance of a 3-phase alternator is determined by performing _____.

(A) short circuit and slip test

(B) zero power factor and slip test

(C) open-circuit and zero power factor test

(D) open and short circuit tests

25. In case of TRC (Time Ratio Control), _____ is varied

(A) firing angle

(B) duty cycle

(C) supply frequency

(D) supply voltage magnitude

26. The average overall thermal efficiency of diesel cycle is _____.

(A) 36%

(B) 20%

(C) 50%

(D) 75%

27. Kirchhoff's law is not applicable to circuits with _____.

(A) Lumped parameters

(B) Passive elements

(C) Distributed parameters

(D) linear resistances

28. Frosting of evaporator tubes results in _____.

(A) Increased heat transfer rate

(B) Increased compressor pressure

(C) Decreased heat transfer rate

(D) Decreased compressor pressure

[6-C-5]

29. possessing which one of the following special graphite structures is best suited for damping capacity in engineering applications ?

(A) Excess cementite

(B) Carbon in temper form

(C) Silicon carbide in flake structure

(D) Spheroidal form of graphite

30. A flywheel on a motor speeds up from rest to 1000 rpm in 6 seconds. The number of revolution made thereby is nearly _____

(A) 200

(B) 100

(C) 50

(D) 20

31. The harness of lathe bed material should be measured by _____

(A) Rockwell tester

(B) Brinell hardness tester

(C) Shore Scleroscope

(D) Vickers hardness tester

32. If the principal stresses and maximum shearing stresses are of equal numerical values at a point a stresses body, the state of stress can be termed as _____

(A) Isotropic

(B) Uni-axial

(C) Pure shear

(D) Generalized plane state of stress

33. Torque speed characteristics of a 2-phase induction motor is largely effected by _____

(A) voltage

(B) speed

(C) X/R ratio

(D) supply frequency

34. 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

35. The function of snubber circuit connected across an SCR is to _____

(A) suppress dv/dt

(B) increase dv/dt

(C) decrease dv/dt

(D) Keep transient over voltage at a constant

[6-C-6]

36. In an electric circuit, the number of independent meshes M is (where B is number of branches and N is number of nodes)

(A) 2B-N+1

(B) B-N+1

(C) 2B-N-1

(D) B-N-1

37. A helical compression spring of stiffness k is cut into two pieces, each having equal number of turns and kept side by side under compression. The equivalent spring stiffness of this new arrangement is equal to _____ .

(A) 4k

(B) 2k

(C) k

(D) 0.5k

38. In case of power screws, what is the combination of materials used for the screw and the nut ?

(A) Cast iron screw and mild steel nut

(B) carbon steel screw and phosphor bronze nut

(C) cast iron screw and cast iron nut

(D) Aluminium screw and alloy steel nut

39. The number of instantaneous centres of rotation in a slider crank quick return mechanism is _____ .

(A) 10

(B) 8

(C) 6

(D) 4

40. It burns with long yellow and smoky flame.

(A) Peat

(B) Lignite

(C) Bituminous coal

(D) Anthracite coal

41. The slope of the sublimation curve on P-T diagram for all substances is _____ .

(A) Zero

(B) Positive

(C) Negative

(D) Variable

[6-C-7]

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36. In an electrical network the number of independent meshes M is (where B is number of branches and N is number of nodes)

(A) 2B-N+1

(B) B-N+1

(C) 2B-N-1

(D) B-N-1

37. A helical compression spring of stiffness k is cut into two pieces, each having equal number of turns and kept side by side under compression. The equivalent spring stiffness of this new arrangement is equal to _____.

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(B) Positive

(C) Negative

(D) Variable

[6-C-7]

42. In case of the 120° mode of operation _____ devices conduct at a time.

(A) 2

(B) 3

(C) 4

(D) 6

43. Induction generator deliver power at _____.

(A) lagging power factor only

(B) unity power factor only

(C) leading power factor only

(D) any power factor

44. The dual of a parallel R-C circuit is _____.

(A) Series R-C circuit

(B) Series R-L circuit

(C) Parallel R-C circuit

(D) Parallel R-L circuit

45. Find the output voltage for a step-up chopper when it is operated at a duty cycle of 50 % and Vs = 240 V.

(A) 240 V

(B) 560 V

(C) 480 V

(D) 120 V

46. Atomic packing factor in the case of copper crystal is _____.

(A) 0.52

(B) 0.68

(C) 0.74

(D) 1.633

47. In a double cage induction motor, the under cage has _____.

(A) High R and High X

(B) High R and Low X

(C) Low R and High X

(D) Low R and Low X

48. A diode rectifier with a C filter will have average output voltage _____ than that obtained by a rectifier without the C filter.

(A) lower than

(B) higher than

(C) same as

(D) none of the mentioned

49. Which one of the following mediums is used for the fastest cooling rate of steel quenching?

(A) Air

(B) Oil

(C) Water

(D) Brine

[6-C-8]

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50. If the load on ball bearing is halved, its life _____

(A) Remains unchanged

(B) Increases two times

(C) Increases four times

(D) Increases eight times

51. A 230 V 50 Hz single phase energy meter has a load current of 10 A at 0.8 p.f. lagging. The energy consumed by load in 2 minutes is _____.

(A) 0.06 kWh

(B) 1.2 kWh

(C) 1.84 kWh

(D) 2.4 kWh

52. A shunt generator running at 1000 r.p.m. has generated e.m.f. as 200 V. If the speed increases to 1200 r.p.m. the generated e.m.f. will be nearly _____.

(A) 150 V

(B) 175 V

(C) 240 V

(D) 290 V

53. Increase in entropy of a system represents _____.

(A) Increase in availability of energy

(B) Increase in temperature

(C) Decrease in pressure

(D) Degradation of energy

54. Why is an offset provided in a radial cam translating follower mechanism ?

(A) To avoid obstruction due to some other machine part

(B) To decrease pressure angle during ascent of the follower

(C) To increase pressure angle during ascent of the follower

(D) To decrease pressure angle during descent of the follower

55. In a closed loop control system _____.

(A) control action is independent of output

(B) output is independent of input

(C) there is no feedback

(D) control action is dependent on output

[6-C-9]

56. The output of a logic gate is 1 when all its inputs are at logic 0. Then the gate is _____

   (A) a NOR gate   (B) a NAND gate

   (C) an OR gate   (D) an AND gate

57. A high pressure angle for spur gears leads to _____.

   (A) Minimum axial thrust   (B) Greater backlash

   (C) More interference   (D) Wide base and stronger tooth

58. A 16 bit memory address register can address memory locations of _____

   (A) 16 k   (B) 32 k

   (C) 64 k   (D) 128 k

59. The properties of water and steam become identical at _____.

   (A) 0.1 bar   (B) 1 bar

   (C) 100 bar   (D) 212.2 bar.

60. As compared to the time period of a simple pendulum on the earth, its time period on the mo will be _____

   $$T = 2\pi\sqrt{\frac{l}{g}}$$

   (A) 6 times higher   (B) 6 times lower

   (C) $\sqrt{6}$ times higher   (D) $\sqrt{6}$ times lower

61. Opposed to great or sudden change. (Give one word for the expression.)

   (A) Conservative   (B) Revolutionary

   (C) Evolutionary   (D) Static

62. Speculations and hypothesising are the most essential and well known aspects of inventions. (Find the correct phrase for undelined.)

   (A) hypothesis has been   (B) hypothesising needs

   (C) hypothesis makes   (D) No corrections required

[6-C-10]

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63. Because of the heavy rain, the match was _____. (Choose the correct alternative out of the four, to make meaningful sentence.) .

(A)   set aside

(B)   called off

(C)   fallen off

(D)   broken off

64. Yogic exercises and meditation <u>seems to be a help</u> modern men and women deal effectively with anxiety. (Find the correct phrase for undelined.)

(A)   seem to help

(B)   seems to be helping

(C)   seem to have help

(D)   seems to help

65. If it were true that enduring lesson are learned from _____ errors, Broadway would be the repository of _____ theatrical wisdom. (Choose the correct option for each blank that best fits into the meaning of the sentence as a whole :)

(A)   accidental, occult

(B)   egregious, sublime

(C)   dubious, profound

(D)   dramatic, lasting

66. પ્રાર્થના સમાજની સ્થાપના કઇ સાલમાં ડો. આત્મારામ પાંડુરંગ દ્વારા કરવામાં આવેલ ?

(A)   1867

(B)   1862

(C)   1872

(D)   1887

67. "શિયાળે શીતળ વા વાય, પાન ખરે, ધઉં પેદા થાય" - એ કયો છંદ છે ?

(A)   મનહર

(B)   શિખરિણી

(C)   મંદાક્રાંતા

(D)   ચોપાઇ

68. વેઇટ લીફ્ટર મીરાબાઇ ચાનુએ ટોકીયો ઓલિમ્પીકમાં કઇ કેટેગરીમાં રજત ચંદ્રક મેળવ્યો ?

(A)   49 Kg.

(B)   55 Kg.

(C)   59 Kg.

(D)   45 Kg.

[6-C-11]

In Below Questions, each passage consists of six sentences. The first and the sixth sentences are given in the beginning. The middle four sentences in each have been removed and jumbled up. These are labelled P,Q, R and S. You are required to find out the proper order for the four sentences :

69. "S1: There are numerous kinds of superstitions in different parts of the country.

S6: A dog's howling predicts death- this is a typical superstition.

P: But people go on respecting it through force of blind custom.

Q: Most of them have a bearing on ""luck""-good or bad.

R: Superstitions, usually have their origin in fear and ignorance.

S: Nobody remembers now how a superstition first started in remote ages.

(A) QPRS

(B) RSPQ

(C) RSQP

(D) QSPR

70. "S1: Society in every country shapes itself out of it own initiative.

S6: And our Indian women are as capable of doing it as any in the world.

P: No one can or ought to do this for them.

Q: Our part of duty lies in imparting true education to all men and women in society.

R: Woman must be put in a position to solve their own problems in their own way.

S : It will not be then necessary to pull down or set us anything in society by coercion.

(A) SRQP

(B) QRSP

(C) QSRP

(D) SRPQ

71. નીચેનામાંથી કયો વિકલ્પ બંધ બેસતો નથી ?

(A) વિધ્ુત

(B) વિષ

(C) વીજળી

(D) દામિની

72. ગુજરાત યુનિવર્સિટીની સ્થાપના કયા વર્ષમાં થઇ હતી ?

(A) 1950

(B) 1949

(C) 1951

(D) 1952

[6-C-12]

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73. 2021ની વિમ્બલ્ડન ટેનિસ ટુર્નામેન્ટમાં પુરૂષોની ફાઇનલ મેચમાં પરાજય પામનાર ખેલાડી કોણ હતો ?

(A) જોકોવિક
(B) માટ્ટેયો બેરીટીની

(C) રોજર ફેડરર
(D) પીટ સાંપ્રાસ

74. સ્વતંત્રતા ચળવળની પ્રથમ ગોળમેજી પરિષદ ક્યારે યોજાઇ હતી ?

(A) 1931
(B) 1930

(C) 1032
(D) 1934

75. "બંધિયાર પાણીમાં થતી ચીકણી વનસ્પતિ" _____

(A) લીલી
(B) લાલી

(C) લીલ
(D) શણ

76. ભારત ખાતેના અંતિમ વાઇસરોય લોર્ડ માઉન્ટ બેટનનો ભારત ખાતેનો વાઇસરોય તરીકેનો કાર્યકાળ કયો હતો ?

(A) 1944 - 1947
(B) 1945 - 1947

(C) 1946 - 1947
(D) 1947 – 1947

77. 2016ના ICC - T20 વર્લ્ડ કપમાં વેસ્ટ ઇન્ડીઝની ટીમે કોને હરાવ્યા હતા ?

(A) ઓસ્ટ્રેલિયા
(B) ઇંગ્લેન્ડ

(C) પાકિસ્તાન
(D) દક્ષિણ આફ્રિકા

78. "લાગી આવવું" રૂઢિપ્રયોગનો અર્થ શું થાય ?

(A) પગમાં લાગવું
(B) દુ:ખ થવું

(C) પગે લાગવું
(D) લગ્નમાં જવું

79. પ્રખ્યાત પુસ્તક નીલ દર્પણ કોણે લખ્યું છે ?

(A) ગિરિશચંદ્ર ઘોષ
(B) દિનબંધુ મિત્રા

(C) બિંદુ માધવ
(D) નુરૂલ હસન ચૌધરી

80. 2021માં ઇઝરાયેલના વડાપ્રધાન કોણ બન્યા ?

(A) બેનેટ

(B) બેન્જામીન નેત્યનાહુ

(C) બેની ગેન્ટેઝ

(D) મોઝે શેરોટ

81. "આ સૂની સૂની ચતમાં, કોઇ ઢોલક હજૂ બજાવે" એ કયો છંદ છે ?

(A) ચોપાઇ

(B) મનહર

(C) અનુષ્ટુપ

(D) શિખરિણી

82. સામાન્ય રીતે હાઇકોર્ટના મુખ્ય ન્યાયાધીશની નિમણૂંક બંધારણની કઇ કલમને આધારે કરવામાં આવે છે ?

(A) 356

(B) 217

(C) 224

(D) 357

83. સરોજ = _____.

(A) સ + રોજ

(B) સર + ઈજ

(C) સરઃ + જ

(D) સર + ઓજ

84. તુઘલખ વંશનું સામ્રાજ્ય (Tughlaq Dynasty) કયા વર્ષમાં ભારત પર હતું ?

(A) 1320 - 1414

(B) 1414 - 1451

(C) 1451 - 1526

(D) 1526 – 1605

85. રાષ્ટ્રધ્વજની લંબાઇ : પહોળાઇ (ઊંચાઇ) કયા પ્રમાણમાં હોવી જોઇએ ?

(A) 2 : 3

(B) 2.5 : 3.5

(C) 3 : 2

(D) 3.5 : 2.5

86. મુઘલ સમ્રાટ અકબર કેટલા વર્ષની ઉંમરે રાજા બન્યા હતા ?

(A) 21

(B) 14

(C) 24

(D) 17

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37. ગોવાને પોર્ટુગીઝ શાસનમાંથી-કયા વર્ષમાં મુક્ત કરવામાં આવ્યું ?

(A) 1947

(B) 1961

(C) 1960

(D) 1957

88. નીચેનામાંથી કયો સમાસ મધ્યમપદલોપી છે ?

(A) વિદાયગીતો

(B) કુટુંબમાયા

(C) કન્યાપક્ષ

(D) દાળભાત

89. નીચેના વિકલ્પમાંથી કઇ જોડણી સાચી છે ?

(A) ઊર્મીલ

(B) ઉર્મીલ

(C) ઉર્મિલ

(D) ઊર્મિલ

90. ક્રોએશીયા દેશની રાજધાની કઇ છે ?

(A) ઝગરેબ

(B) રૉઝીયુ

(C) સાન્ટીઆગો

(D) માલાબુ

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