megaleap
Comprehensive MCA Entrance Coaching

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HINTS AND SOLUTIONS **TEST CODE: MTIP-II**

1. (c) $f(-x) = (-x)^5+\cos(-x) = -x^5+\cos x \neq f(x)$ or $-f(x)$

2. (a) Let $x<0$. then $(gof)(x) = f(x) = g(x^3+1) = [(x3+1) - 1]^{1/3}$ $\because x<0 \Rightarrow x^3+1<1 = (x^3)^{1/3}=x$ Let $x>0$. Then $(gof)(x) = g(f(x)) = g(x^2+1) = (x^2+1)-1)^{1/2}$ $(\because x\geq 0 \Rightarrow x^2+1 \geq 1)=x$

3. (d) $(1+i^2+2i)^3 + (1-3i+3i^2-i^3) = -2-10i$

4. (a)

$$\left(\frac{\frac{-(-1-i\sqrt{3})}{2}}{\frac{-(-1+i\sqrt{3}}{2}}\right)^6 + \left(\frac{\frac{-(-1+i\sqrt{3})}{2}}{\frac{-(-1+i\sqrt{3})}{2}}\right)^6 =$$

$$\left(\frac{\omega^2}{\omega}\right)^6 + \left(\frac{\omega}{\omega^2}\right)^6 = \omega^6 + \frac{1}{\omega^6} = 1+1 = 2$$

5. (b)

6. (c)

7. (b)

8. (a) $\Delta =$

$$\begin{vmatrix} \log x & \log y & \log z \\ \log z+\log x & \log z+\log y & \log z+\log z \\ \log 3+\log x & \log 3+\log y & \log 3+\log z \end{vmatrix}$$ operate R_2-R_1 and R_3-R_1 to get 0.

9. (b) $|2x-3| <|x+2| \Leftrightarrow -|x+2| <2x-3 <|x+2|$..(1) Case I $x+2\geq 0$. Then (1) $\Rightarrow -x-2<2x-3<x+2 \Rightarrow 1<3x$ and $x<5$ $\Rightarrow 1/3<x<5$ Case II $x+2<0$. Then (1) $\Rightarrow -(x+2) >2x-3 > (x+2) \Rightarrow 1>3x$ and $x>5$ i.e. $1/3 >x$ and $x>5$, not possible.

10. (c) $|3-x| = x-3$ iff $3-x \leq 0 \Rightarrow 3 \leq x$.

11. (b) $|x|^2+|x|-6 = 0 \Rightarrow |x| = -3,2 \Rightarrow |x| =2 \Rightarrow x = 2, -2$

12. (c) Let roots be α and α^2. $\Rightarrow \alpha+\alpha^2=1$ and $\alpha . \alpha^2=\alpha^3 = -k \Rightarrow (\alpha+\alpha^2)^3 = 1 \Rightarrow \alpha^3+\alpha^6+3\alpha.\alpha^2 (\alpha+\alpha^2)=1 \Rightarrow -k+(-k)^2+3(-k)(1) =1 \Rightarrow k^2-4k-1=0$
$\Rightarrow k=2+\sqrt{5}, 2-\sqrt{5}$

13. (b)

$$\alpha+\beta=\frac{3}{8}, \quad \alpha\beta=\frac{27}{8}$$

$$\therefore \left(\frac{\alpha^2}{\beta}\right)^{1/3} + \left(\frac{\beta^2}{\alpha}\right)^{1/3} = \frac{\alpha+\beta}{(\alpha\beta)^{1/3}} = \frac{1}{4}$$

14. (c) No. of ways of filling Ist place =9 ($\because$ '0' cannot be placed) No. of ways of filling remaining 8 places = $9\times8\times7\times6\times5\times4\times3\times2 = 9!$
$\therefore$ Total No. of ways $9\times9!$

15. (c) ${}^4c_1 \times {}^8c_5 = 4\times56 = 224$

16. (b) As n varies from 0 to 21, the value of n!(21-n)! is 0!21!, 1!20!, 2!19!, .. 10!11!, 11! 10! … 21!0!. Among these the minimum is 11! 10!

17. (a) put n=1.

18. (c) $T_{r+1} = 6_{Cr}(2x)^{6-r}\left(\frac{1}{3x}\right)^r$

$= 6c_r\left(\frac{2^{6-r}}{3^r}\right)x^{6-2r}$ let Tr+1 be independent of x. Then 6-2r $= 0 \Rightarrow r=3$ Find T_4

19. (c) 0.2+0.22+0.222+….. n terms

$$=\frac{2}{9}[(1-0.1)+(1-0.01)+..\quad n\ terms]$$

$$=\frac{2}{9}\left[n-\frac{\left(1/10\right)\left\{1-\left(1/10\right)^{n}\right\}}{1-\left(1/10\right)}\right]=\frac{2}{9}\left[n-\frac{1}{9}\left(1-10^{-n}\right)\right]$$

20. (b) $\frac{1}{q+r}-\frac{1}{p+q}=\frac{1}{r+p}-\frac{1}{q+r}$

$\Rightarrow p^2-q^2=r^2-p^2\Rightarrow q^2,p^2,r^2 are\ in\ A.P.$

21. (d) Sum

$$=\frac{1}{\log_2 4}-\frac{1}{\log_2 8}+\frac{1}{\log_2 16}.....$$

$$=\frac{1}{2\log_2 2}-\frac{1}{3\log_2 2}+\frac{1}{4\log_2 2}.....$$

$$=\frac{1}{2}-\frac{1}{3}+\frac{1}{4}.....=1-\left(1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+...\right)$$

$=1-\log_e 2$

22. (a) f(x) is real if $x^2-3x+2>0 \Rightarrow (x-1)(x-2)>0$ i.e $x\ \varepsilon\ (-\infty,1)\cup[2,\infty]$

23. (d) Suppose, if possible, $\cos x^2$ be periodic with period λ. Then, $\cos(\lambda+x)^2=\cos x^2$ for each real x.

$\therefore (\lambda+x)^2=2n\pi\pm x^2$

$\Rightarrow x^2+2\lambda x+\lambda^2\pm x^2=2n\pi$

Which is not possible as L.H.S. is a quadratic function of a continuous variable x and R.H.S is an integral multiple of π.

24. (c) Apply L'Hospital's rule and get two equations a-b = - 1 and –3a+b = 6

25. (a) $\lim_{x\to 1}\frac{\log x}{\cos\left(\frac{\pi x}{2}\right)}\left(\frac{0}{0}\right)$

26. (a) Let $u=\cos^{-1}(2x^2-1)$ and $v=\cos^{-1}x$. put $x=\cos\theta\Rightarrow \frac{du}{d\theta}=z,\frac{dv}{d\theta}=1\therefore\frac{du}{dv}=\frac{du/d\theta}{dv/d\theta}=2$

27. (a) use chain rule

28. (b)

29. (d) Vertical tangent means tangent parallel to y-axis $\Rightarrow \frac{dy}{dx}=\infty$

30. (a) $\int e^x\left(\tan x+\sec^2 x\right)dx=e^x\ \tan x+c$

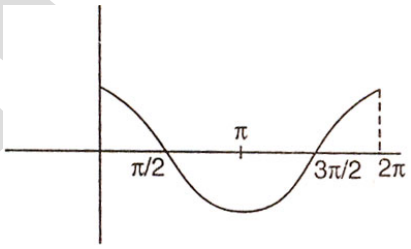
31.(a) $g(x+\pi)=\int_0^{\pi+x}\cos^4 t\ dt$

$$=\int_0^{\pi}+\int_{\pi}^{\pi+x}\cos^4 t\ dt$$

$$\int_0^{\pi}\cos^x+dt+\int_0^{x}\cos^4\theta\ d\theta$$

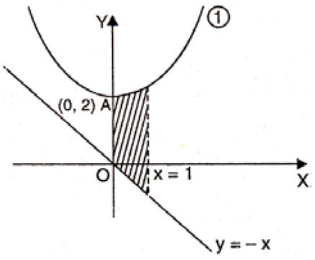
$(put\ t=\pi+\theta\ in\ \sec ond\ \text{int}egral)$

32. (d)



Required area = $4\int_0^{\pi/2}\cos x\,dx$

33. (a)



Required area = $\int_0^1\left(x^2+2\right)dx+\left|\int_0^1(-x)\,dx\right|=\frac{7}{16}$

34. (c) $\frac{dy}{dx}+y\frac{\sin x}{\cos x}=\frac{1}{\cos x}$ which is a linear equation. Now find integrating factor.

35. (d) **36. (b)**

37. (a) A(0, 4), B(1, 1), (4, 0), AB=BC=$\sqrt{10}$

38. (c) **39. (a)** **40. (b)**
41. (a) **42. (a)** **43. (d)**
44. (b) **45. (b)** **46. (c)**
47. (a) **48. (b)** **49. (c)**
50. (c) **51. (a)** **52. (d)**
53. (a) "terrorist" be replaced by "terrorism".

54. (d)

55. (b) "therefore" be replaced by "yet".

56. (c) "few" be replaced by "another".

57. (a) **58. (b)** **59. (c)**
60. (c) **61. (c)** **62. (a)**
63. (b) **64. (c)** **65. (c)**
66. (b) **67. (b)** **68. (a)**
69. (d) **70. (c)** **71. (b)**
72. (a) **73. (d)** **74. (a)**
75. (a)

76. (a) Polling allows checking the status of every input/output device one after the other while interrupt eliminates polling using interrupt handler.

77. (d)

78. (c) Round robin divides time into small but equal intervals such as 10 nano seconds, and process each job for that many seconds, then transfers control to next job, to next, ------- to last and then goes back to first job.
LIFO: Last In First Out. The job entered last in the system is executed first
FIFO: First In First Out. The job entered first in the system is executed first.

79. (b) **80. (b)** **81. (b)**
82. (d) **83. (c)** **84. (d)**

85. (d) All others are the operating system.

86. (b) **87. (a)**

88. (d) Structured Programming is that programming methodology that supports sequencing, branching and looping of instructions.

89. (d) Syntax Errors (grammatical errors) e.g." missing braces "," invalid data type". Logical errors: due to lack of proper logic e.g. in place of addition user has done multiplication. Execution errors occur during program execution e.g. "division by zero", "square root of a negative number".

90. (d) All others are types of programming language of computers.

91. (d) **92. (d)** **93. (a)**
94. (b)

95. (d) Simplex mode: data is transmitted in only one direction. Half-Duplex: data can be transmitted in both directions but only in one direction at a time. Full-Duplex; data can be transmitted in both directions at any time.

96. (a) **97. (b)**

98. (c) PDP is a type of computer, not computer code.

99. (b) **100. (b)** **101. (c)**
102. (c)

103. (a) LAN (local area network)is only for small area, Ethernet is an example of LAN.IEEE(Institute of Electrical and Electronic Engineers)issues networking standards.

104. (b) **105. (d)** **106. (b)**
107. (c) **108. (c)** **109. (a)**
110. (a) **111. (b)** **112. (d)**
113. (b)

114. (d) None is strong. First is weak as it is based open example. Second is weak as it is debatable.

115. (d) **116. (a)** **117. (a)**

118. (c) Although no certain conclusion can be derived because it is not given whether X was hit by a bullet or not, get one of the two conclusions must be true.
119. (d) **120. (d)** **121. (b)**

122. (b) III is good but may not hold true; a child may not fight kidnappers even after learning martial arts.

123. (c) **124. (d)**

125. (b) no of sides = 360° / (angle subtended by any side)

126. (c) **127. (c)** **128. (a)**
129. (c) **130. (a)** **131. (c)**
132. (b) **133. (c)** **134. (a)**
135. (c)

Direction (Q. 136 - 140): ✓ indicates condition is fulfilled, ✗ indicates condition not fulfilled .E: indicates emphasized condition

136. (b)	X	✓	X	✓	X E	✓	X	X
137. (b)	✓	X	✓	✓	X E	X	X	X
138. (a)	✓	✓	✓	✓	X	✓ E	X	X
139. (d)	✓	✓	X	✓	X	X	X	✓ E
140. (c)	✓	✓	✓	X	X	X	✓ E	X
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)

Directions (Q. 141 to 145): Y = Yellow, G = Green, Gaz = Gazetteer, O = Old, N = New

	A	B	C	D	E	F
Y/G	Y	G	G	Y	G	Y
L/Gaz	L	L	L	Gaz	Gaz	Gaz
O/N	N	N	O	N	O	O

141. (b) **142. (d)** **143. (c)**
144. (d) **145. (c)**

Directions (Q. 146 to 148): Let C's weight =x. Then D's weight = 2x, E's weight =4x, B's weight = 4.5x and A's weight = 9x. So, order weight A>B>E>D>C

146. (c) **147. (b)** **148. (a)**
149. (a) **150. (d)**