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ACC-II

Previous Year Paper
Aug 2017
(ACT Paper-IV)



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ACC / II / AUG 2017
PAPER IV : ACADEMIC CONTENT TEST (ACT)

SET - C

INDEX No. _____

Time: 3 Hrs

Max Marks: 300

General Instructions

1. There are 150 questions and all questions are compulsory.
2. Mark your response on OMR sheet provided for this part of the exam.
3. Each question carries two marks.
4. Do not write anything on the question paper except your Index No in the space provided.

SECTION A- MATHEMATICS

1. The LCM of (X^2-1) , (X^2+X) and $(X+1)^2$ is
 (a) $(X^2-1)(X+1)$ (b) $(X+1)$ (c) $(X^2-1)(X^2+X)$ (d) $(X^2-1)(X+1)^2$
2. If $(X-1)$ is the HCF of (X^2-1) and $pX^2-q(X+1)$, then
 (a) $p=2q$ (b) $q=2p$ (c) $3p=2q$ (d) $2p=3q$
3. If the mean of first n natural numbers is $5n/9$, then $n =$
 (a) 5 (b) 4 (c) 9 (d) 10
4. One of the methods of determining mode is
 (a) Mode = 2 median – 3 mean (b) Mode = 2 median + 3 mean
 (c) Mode = 3 median – 2 mean (d) Mode = 3 median + 2 mean
5. The line $3x-5y = -10$, cuts y-axis at
 (a) (0,2) (b) (0,1) (c) (0,3) (d) (0,4)
6. The probability of getting a defective pen in a lot of 144 pen is $1/12$, the number of defective pens in the lot are
 (a) 14 (b) 16 (c) 10 (d) 12
7. A can do a piece of work in 15 days and B alone can do it in 10 days. B works at it for 5 days and then leaves. A alone can finish the remaining work in
 (a) $6 \frac{1}{2}$ days (b) $7 \frac{1}{2}$ days (c) 8 days (d) 9 days
8. A can do $\frac{3}{4}$ of a work in 12 days. In how many days can he finish $1/8$ of the work?
 (a) 1 day (b) 2 days (c) 3 days (d) 4 days
9. What would be compound interest on Rs. 5000 for 4 years if the rate of interest is 10% per annum for the first two years and 15% for the next two years?
 (a) 2000 (b) 2500 (c) 3000 (d) 3001
10. Any angle subtended by a major arc in the alternate segment is _____.
 (a) an acute angle (b) an obtuse angle
 (c) a straight angle (d) a right angle

11. If the cost price of 10 articles is equal to the sale price of 12 articles, then the profit or loss percent is _____.
 (a) $15\frac{1}{3}\%$ (b) 12 % (c) $14\frac{2}{3}\%$ (d) $16\frac{2}{3}\%$

12. If any particle moves with the speed v_1 for $1/3^{\text{rd}}$ of its total time and rest of time with the speed v_2 . Then its average speed is
 (a) $(v_1+v_2)/3$ (b) $(2v_1+v_2)/3$ (c) $(v_1+3v_2)/3$ (d) $(v_1+2v_2)/3$

13. If AB and CD are two parallel chords of a circle of radius 3 cm. If the length of AB is 4 cm and CD is 5 cm. Then distance between them is
 (a) $\sqrt{5} + (1/\sqrt{11})$ (b) $(\sqrt{5}/2) + \sqrt{11}$ (c) $\sqrt{5} + (\sqrt{11}/2)$ (d) $(2\sqrt{5}) + \sqrt{11}$

14. 75° is degree when measured in radian is
 (a) $3\pi/4$ (b) $2\pi/3$ (c) $12\pi/5$ (d) None of these

15. A quadratic equation whose one root is 2 and the sum of roots is zero, is
 (a) $X^2 - 4 = 0$ (b) $X^2 + 4$ (c) $4X^2 - 1 = 0$ (d) $X^2 - 2 = 0$

16. A's mother was four times as old as A, ten years ago. After 10 years she will be twice as old as A. Then A's age is
 (a) 20 yrs (b) 25 yrs (c) 15 yrs (d) 16 yrs

17. $\sqrt{3136} = 56$ then the value of $\sqrt{31.36} + \sqrt{.3136} + \sqrt{.003136} + \sqrt{.00003136}$ is
 (a) 17.22 (b) 6.22 (c) 5.91 (d) None of these

18. If the polynomial $x^3 + x^2 - 2x + 1$ is divided by $(x-2)$ then the remainder is _____.
 (a) 0 (b) -2 (c) 9 (d) 10

19. The expansion of $(1 - 1/2)(1 - 1/3)(1 - 1/4) \dots (1 - 1/m)$ gives
 (a) $(m-1)/m$ (b) $2/m$ (c) $1/m$ (d) None of these

20. If $20\% X = 40\% Y$, then find X:Y
 (a) 1:4 (b) 1:2 (c) 2:1 (d) None of these

21. In an election a candidate got 35% of votes but was defeated by other candidate by 750 votes. Then find the total number of votes polled.
 (a) 2000 (b) 2500 (c) 3200 (d) None of these

22. A person sold a watch for 96 and got a percentage profit equal to cost price. Find the CP of watch.
 (a) 60 (b) 50 (c) 40 (d) None of these

23. A and B are two stations 1000 kms apart. A train starts from station A at 70 km/h and another train starts from station B at same time at the rate of 30 km/h speed. How far from A will they cross each other?
 (a) 700 km (b) 300 km (c) 70 km (d) None of these

24. If $\sqrt{4^n} = 1024$, then the value of n is
 (a) 5 (b) 8 (c) 10 (d) 12



25. If the perimeter of a sector of a circle of radius 6.5 cm is 29 cm, then its area is
 (a) 58 cm^2 (b) 52 cm^2 (c) 25 cm^2 (d) 56 cm^2

26. A solid sphere of radius r is melted and cast into the shape of a solid cone of height r , the radius of the base of the cone is
 (a) $2r$ (b) $3r$ (c) r (d) $4r$

27. The curved surface area of a cylinder is 264 m^2 and its volume is 924 m^3 . The ratio of diameter to its height is
 (a) 3:7 (b) 7:3 (c) 6:7 (d) 7:6

28. 12 spheres of same size are made from melting a solid cylinder of 16 cm diameter and 2 cm height. The diameter of each sphere is.
 (a) $\sqrt{3} \text{ cm}$ (b) 2 cm (c) 3 cm (d) 4 cm

29. The volumes of two spheres are in the ratio 64:27. The ratio of their surface areas is
 (a) 1:2 (b) 2:3 (c) 9:16 (d) 16:9

30. A man can swim 4 km/h in still water. If the velocity of stream is 2 km/h, the time taken by him to swim to a place 12 km upstream and back is
 (a) 6 hour (b) 7 hour (c) 8 hour (d) None of these

31. The average age of 40 students in a class is 14 years 10 month. If by the admission of 5 more students, average age decrease by 2 months. Find average age of new students.
 (a) 13.5 year (b) 13.25 year (c) 14 year (d) None of these

32. If A,B and C invest Rs. 5000 in the ratio of 3:8:14. What should be the profit of B if the total profit is Rs. 2500.
 (a) 800 (b) 1400 (c) 400 (d) None of these

33. If $4A = 5B$ and $6B = 7C$ find A:B:C=
 (a) 28:30:35 (b) 35:30:28 (c) 35:28:24 (d) None of these

34. In a right triangle ABC, right angled at C, if $\tan A = 1$, then value of $2\sin A \cos A$ = ?
 (a) $1/\sqrt{2}$ (b) 1 (c) $\sqrt{2}$ (d) $1/2$

35. If $16 \cot A = 12$; then $(\sin A + \cos A) / (\sin A - \cos A)$ is equal to
 (a) $3/4$ (b) $4/3$ (c) 7 (d) 9

36. $(\sin 30^\circ - \sin 90^\circ + 2 \cos 0^\circ) / (\tan 30^\circ \tan 60^\circ)$ is equal to
 (a) $3/2$ (b) $5/2$ (c) $7/2$ (d) $-3/2$

37. Evaluate the value of θ in $\sqrt{3} \tan 2\theta - 3 = 0$
 (a) 30° (b) 45° (c) 60° (d) 90°

38. If $\sin(A+B) = 1$ and $\cos(A-B) = \sqrt{3}/2$, $0^\circ < A+B \leq 90^\circ$, $A > B$ then value of A&B is
 (a) 90° & 60° (b) 60° & 30° (c) 45° & 30° (d) 30° & 60°

39. If point $(a,0)$, $(0,b)$ and $(1,1)$ are collinear, then $1/a + 1/b =$
 (a) 1 (b) 2 (c) 0 (d) -1

40. $\frac{\cos 80^\circ + \cos 59^\circ}{\sin 10^\circ}$ cosec 31° is equal to
 (a) 2 (b) 3 (c) 4 (d) -3

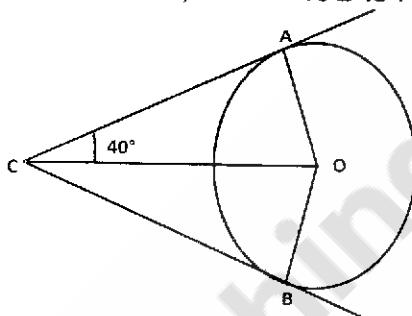
41. If $\sec 4A = \operatorname{cosec}(A-20^\circ)$, where $4A$ is an acute angle, then value of A is
 (a) 24° (b) 22° (c) 25° (d) 30°

42. If $\tan^2 45^\circ - \cos^2 30^\circ = X \sin 45^\circ \cos 45^\circ$, then $X =$
 (a) 2 (b) -2 (c) $-1/2$ (d) $1/2$

43. The value of $\tan 1^\circ \tan 2^\circ \tan 3^\circ \tan 4^\circ \dots \tan 89^\circ$ is
 (a) 1 (b) -1 (c) 0 (d) None of these

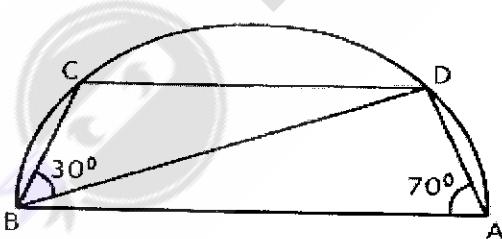
44. $\tan 5^\circ \tan 30^\circ 4 \tan 85^\circ$ is equal to
 (a) $4/\sqrt{3}$ (b) $4\sqrt{3}$ (c) 1 (d) 4

45. In the given figure, if $\angle ACO = 40^\circ$, then $\angle AOB$ is :



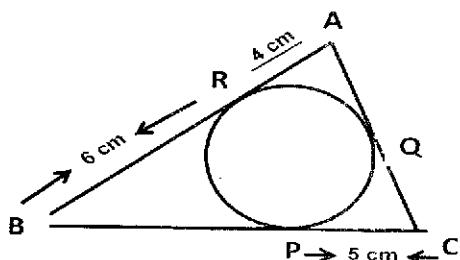
(a) 100° (b) 80° (c) 50° (d) 40°

46. In the figure below, ABCD is a cyclic quadrilateral and C, D are points on the semi-circle described on BA as diameter. If $\angle BAD = 70^\circ$ and $\angle DBC = 30^\circ$, then the values of $\angle ABD$ and $\angle BDC$ are _____ respectively.



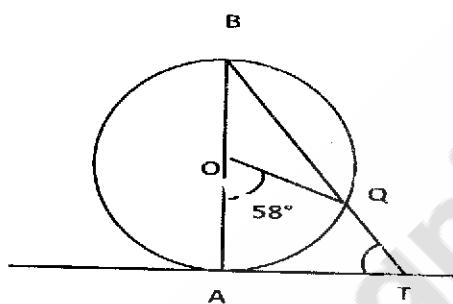
(a) 30° and 40°
 (b) 20° and 40°
 (c) 40° and 30°
 (d) 20° and 50°

47. In the given figure, If $BR = 6\text{cm}$, $RA = 4\text{cm}$ and $PC = 5\text{cm}$ then perimeter of $\triangle ABC$ is



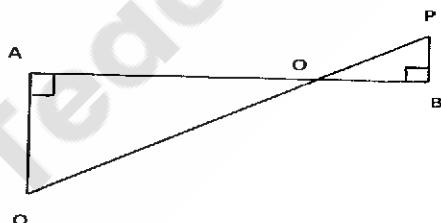
(a) 30 cm (b) 60 cm (c) 45 cm (d) 15 cm

48. In the given figure, AB is a diameter of a circle with centre O and AT is a tangent. If $\angle AQB = 58^\circ$, find $\angle ATQ$.



(a) 29° (b) 61° (c) 58° (d) 71°

49. In given figure, QA and PB are perpendiculars to AB. If $AO = 10\text{cm}$, $BO = 6\text{cm}$ and $PB = 9\text{cm}$. Find AQ.



(a) 15cm (b) 14.5cm (c) 18cm (d) 12cm

50. The factor of $X^2 - 2\sqrt{3}X + 3$ is
 (a) $(X + \sqrt{3})^2$ (b) $(X - \sqrt{3})^2$ (c) $(X + \sqrt{3})(X - \sqrt{3})$ (d) $(X + 2)(X + \sqrt{3})$

SECTION - B (GENERAL SCIENCE)

65. The death of the last individual of a species is called _____
(a) extinction (b) clad (c) both (a) and (b) (d) None of the above

66. Three resistors of $4\ \Omega$, $6\ \Omega$ and $12\ \Omega$ are connected in parallel and the combination is connected in series with 4V battery with internal resistance of $2\ \Omega$. The battery current is
(a) 0.5 (b) 1 A (c) 2 A (d) 10 A

67. When we change feeble sound to loud sound we increase its
(a) Frequency (b) amplitude (c) Velocity (d) wavelength

68. To produce 10^3 joules of heat in 10 seconds, How much voltage should be applied to 100 ohm resistance ?
(a) 50 Volt (b) 110 volt (c) 1000 Volt (d) 100 volt

69. The working of A.C generator is based upon
(a) Magnetic effect of current (b) heating effect of current
(c) electromagnetic induction (d) chemical effect of current

70. A 10 mm long pin is placed vertically in front of a concave mirror. A 5 mm long image of the pin is formed at 30 cm in front of the mirror. The focal length of this mirror is
(a) -30 cm (b) -20 cm (c) -40 cm (d) - 60 cm

71. A piece of iron of density $7.8 \times 10^{-3}\ \text{kg/m}^3$ and volume $100\ \text{cm}^3$ is totally immersed in water, then upthrust is (density of water is $1000\ \text{kg/m}^3$)
(a) 1 N (b) 10 N (c) 100 N (d) 1000N

72. The work done on an object does not depend upon the
(a) displacement (b) force applied
(c) angle between force and displacement (d) initial velocity of the object

73. The gravitational force between two object is F. If masses of both object are halved without changing distance between them, then the gravitational force would become
(a) $F/4$ (b) $F/2$ (c) F (d) $2 F$

74. The women applies the force of 60 N to draw a 5 kg bucket of water from a well then the mechanical advantage
(a) 0.73 (b) 0.83 (c) 0.93 (d) 1.53

75. A person cannot see distinctly object kept beyond 2 m. This defect can be corrected by using a lens of power
(a) +0.5 D (b) -0.5 D (c) +0.2 D (d) -0.2 D

76. Heat is transmitted from a region of higher temperature to a region of a lower temperature through molecular collisions in
(a) conduction (b) convection (c) radiation (d) all the three

77. Choose the incorrect statement from the following regarding magnetic lines of field
(a) The direction of magnetic field at a point is taken to be the direction in which the north pole of a magnetic compass needle points.
(b) Magnetic field lines are closed curves.
(c) If magnetic field lines are parallel and equidistant, they represent zero field strength.
(d) Relative strength of magnetic field is shown by the degree of closeness of the field lines.

78. The dimensions of wooden block are $2\text{ m} \times 0.25\text{ m} \times 0.10\text{ m}$. If relative density of wood is 0.6, then the mass of the block is (Density of water) = 10^3kgm^{-3} .
(a) 20 kg (b) 30 kg (c) 40 kg (d) 50 kg

79. An object of mass m is taken to the moon from the earth
(a) Mass and weight of the object will be same as on the earth.
(b) Mass of the object decreases but its weight will remain the same on the moon.
(c) Mass of the object increases but its weight will remain the same on the moon.
(d) Mass of the object remains the same but its weight decrease on the moon.

80. The force needed to change the velocity of a 1 kg body from 20 ms^{-1} to 30 ms^{-1} in 2s is
(a) 5 N (b) 10 N (c) 20 N (d) 25 N

81. Which of the following is a compound?
(a) water (b) air (c) oxygen (d) iron

82. Rusting of iron is an example of
(a) oxidation (b) reduction (c) neutralization (d) both oxidation and reduction.

83. Which of the following metal does not release hydrogen gas on reaction with dil. HCl?
(a) sodium (b) magnesium (c) copper (d) zinc

84. Which of the following is used as cooking gas?
(a) pentane (b) butane (c) hydrogen (d) carbon dioxide

85. Which of the following is not present in NPK fertilizer?
(a) Nitrogen (b) Phosphorous (c) Krypton (d) potassium

86. Soaps are generally salts of fatty acids containing
(a) calcium (b) magnesium (c) sodium (d) zinc

87. Which of the following is added to delay the setting of cement?
(a) clay (b) Alumina (c) Zypsum (d) Blue vitriol

88. Which of the following is the symbol of Potassium?
(a) P (b) Po (c) K (d) N

89. What is added to render glass insoluble in water?
(a) Lime (b) Lead (c) Silver Bromide (d) Soda

90. Safety matches contain
(a) phosphorus (b) chlorine (c) silicon (d) fluorine

91. Paper is mainly made of
(a) Cellulose (b) silk (c) Wool (d) silica

92. Which of the following is not present inside the nucleus of an atom?
(a) neutron (b) proton (c) electron (d) none of these

93. Chemical formulae of Mohr's salt is
(a) $\text{FeSO}_4 \cdot (\text{NH}_4)_2 \text{SO}_4 \cdot 6\text{H}_2\text{O}$ (b) $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
(c) $\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ (d) $\text{K}_4[\text{Fe}(\text{CN})_6]$

94. Which of following is not a nobel gas?
(a) Helium (b) Xenon (c) Radium (d) Neon

95. Which of these is a physical change?
(a) Changing of milk to curd (b) Rusting of iron
(c) melting of wax (d) burning of paper.

96. Which is known as suicidal bags of the cell?
(a) Mitochondria (b) Ribosome (c) Lysosome (d) Nucleolus

97. The fibrous sheath that connects bone to bone is called
(a) Ligament (b) Tendon (c) Sheath (d) Periosteum

98. Which part of alimentary canal receives bile from the liver?
(a) Stomach (b) Small intestine
(c) Large intestine (d) Oesophagus

99. Which of the following is the correct sequence of events of sexual reproduction in a flower?
(a) Pollination, fertilization, seedling, embryo
(b) seedling, embryo, fertilization, pollination
(c) pollination, fertilization, embryo, seedling
(d) embryo, seedling, pollination, fertilization

100. Reproduction is essential for living organisms in order to
(a) keep the individual organism alive
(b) fulfill their energy requirement
(c) maintain growth
(d) continue the species generation after generation

SECTION-C (HUMANITIES)

101. The Eastern Coast of India is known as
(a) Eastern Plateau (b) Bengal Coast
(c) Coromandal Coast (d) Cyclonic Coast

102. India lies in hemisphere
(a) Northern and Eastern (b) Southern and Eastern
(c) Northern and Western (d) Northern and Southern

103. By which name does the Brahmaputra enter into India?
(a) Manas (b) Dhansiri (c) Dihang (d) Tsangpo

104. Singhbhum is famous for
(a) Coal (b) Iron (c) Copper (d) Both 'b' and 'c'

105. Longest National Highway of India
(a) NH 15 (b) NH 44 (c) NH 35 (d) NH 4

106. The 'Grand Trunk Road' connects
(a) Kolkata and Mumbai (b) Delhi and Chennai
(c) Kolkata and Amritsar (d) Tirupati and Ludhiana

107. Economic Planning is a subject
(a) In the Union list (b) In the State list
(c) In the concurrent list (d) Unspecified in any special list

108. 'Take off stage' in an economy means
(a) Steady growth begins (b) Economy is stagnant
(c) Economy is about to collapse (d) All controls are removed

109. The 'Slack Season' in the Indian Economy is
(a) March-April (b) Sept-Dec (c) Jan-June (d) Feb-April

110. What is main objective of Antyodaya Programme?
(a) Uplift the poor (b) Uplift the urban poor
(c) Uplift the farmer (d) Uplift the landless labour

111. Who among the following is most benefitted from inflation?
(a) Government pensioners (b) Creditors
(c) Savings Bank Account holders (d) Debtors

112. Name the animal on the insignia of the RBI?
(a) Lion (b) Tiger (c) Panther (d) Elephant

113. If the price of an inferior good falls, its demand
(a) Rises (b) Falls (c) Remains constant (d) Any of these

128. 'Mahatma' was added before Gandhiji's name during
(a) Champaran Satyagraha (b) Rowlett Satyagraha
(c) Amritsar Session of INC in 1919 (d) Initial stages of Khilafat Movement

129. Who was known as the 'Liberator of the Press' ?
(a) Bentinck (b) Hastings (c) Metcalfe (d) Macaulay

130. Right to Constitutional Remedies comes under
(a) Fundamental rights (b) Legal rights
(c) Constitutional rights (d) Natural rights

131. Chief Ministers of all the states are ex-officio members of the
(a) Finance commission (b) Planning commission
(c) National Development Council (d) Inter State Council

132. The Union list contains
(a) 47 Subjects (b) 97 Subjects (c) 63 Subjects (d) 92 Subjects

133. The powers of election commission are given in which of the following Articles of the Indian Constitution
(a) 286 (b) 356 (c) 324 (d) 382

134. Who is the highest law officer of a State?
(a) Attorney General (b) Advocate General
(c) Solicitor General (d) Secretary General law department

135. The Union Territories get representation in
(a) Lok Sabha (b) Rajya Sabha (c) Both Houses of Parliament (d) None of these

136. The largest committee of Parliament of India is
(a) Public Accounts Committee (b) Estimate Committee
(c) Committee on Public Undertakings (d) Joint Parliament Committee

137. Salaries of the Judges of Supreme Court are drawn from
(a) Grants-in-aid (b) Contingency Fund
(c) Consolidated Fund (d) Public Accounts

138. The only Union Territory which has a High Court of its own
(a) Delhi (b) Lakshadweep (c) Chandigarh (d) Daman and Diu

139. The Ninth Schedule of the Constitution of India was
(a) Added by the first amendment (b) Added by the 24th amendment
(c) Added by the 42nd amendment (d) A part of the original Constitution

140. Father of local self Government in India is
(a) Lord Mayo (b) Acharya Vinoba Bhave
(c) Lord Ripon (d) Mahatma Gandhi

141. Who is the executive head of a Municipal Corporation?
(a) Mayor (b) Commissioner (c) Secretary (d) Deputy Mayor

142. The amendment procedure laid down in Indian Constitution is on the pattern of
(a) Constitution of Canada (b) Government of India Act, 1935
(c) Constitution of South Africa (d) Constitution of USA

143. The Second Five Year Plan laid more stress upon
(a) Agriculture (b) Industrialisation (c) Removing poverty (d) Self-reliance

144. 'Parsec' is the unit of measurement of
(a) Density of stars (b) Astronomical distance
(c) Brightness of heavenly bodies (d) Orbital velocity of giant stars

145. Super Nova is
(a) An asteroid (b) A black hole (c) A comet (d) A dying star

146. The earth is at the least distance from the Sun (Perihelion) on
(a) December 22nd (b) January 3rd (c) July 4th (d) June 21st

147. The Sun reaches its maximum angular distance from the equator at the
(a) Zenith (b) Solstice (c) Equinox (d) Noon time

148. Density of the core of the earth is expected to be
(a) 2.75 (b) 5 (c) 5.68 (d) 11 or more

149. Doldrums are
(a) High latitudes with heavy snow (b) Equatorial zone with low pressure
(c) High pressure areas on mountains (d) Sub-polar zone with high pressure

150. Atmospheric humidity is measured by
(a) Psychrometer (b) Anemometer (c) Lysimeter (d) Hydrometer



SPACE FOR ROUGH WORK