FIITJEE Talent Reward Exam

for student presently in
Class 8

A

PAPER–2

Time: 3 Hours **CODE A8** ***Maximum Marks: 258***

Instructions:

Caution: Question Paper CODE as given above MUST be correctly marked in the answer OMR sheet before attempting the paper. Wrong CODE or no CODE will give wrong results.

1. You are advised to devote 1 Hour on Section-I and 2 Hours on Section-II and Section-III.

2. This Question paper consists of 3 sections. All questions will be multiple choice single correct out of four choices with marking scheme in table below:

Section			Question no.	Marking Scheme for each question	
				correct answer	wrong answer
SECTION – I (IQ)			Q. 1 to 11	**+2**	**0**
			Q. 12 to 17	**+3**	**–1**
			Q. 18 to 22	**+6**	**–2**
SECTION – II (SCIENCE & MATHEMATICS)	Part –A	Physics	Q. 23 to 27	**+4**	**–1**
	Part –B	Chemistry	Q. 28 to 32	**+4**	**–1**
	Part –C	Mathematics	Q. 33 to 37	**+4**	**–1**
	Part –D	Biology	Q. 38 to 42	**+4**	**–1**
SECTION – III (SCIENCE & MATHEMATICS)	Part –A	Physics	Q. 43 to 48	**+6**	**–2**
	Part –B	Chemistry	Q. 49 to 54	**+6**	**–2**
	Part –C	Mathematics	Q. 55 to 60	**+6**	**–2**

3. Answers have to be marked on the OMR sheet.

4. The Question Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.

5. Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.

6. **Before attempting paper write your Name, Registration number** and **Test Centre** in the space provided at the bottom of this sheet.

Note:

Check all the sheets of this question paper. Please ensure the same SET is marked on header of all the sheets inside as indicated above 'Maximum Marks' of this page. In case SET marked is not the same on all pages, immediately inform the invigilator and CHANGE the Questions paper.

Registration Number : ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Name of the Candidate : _____

Test Centre : _____

Section-I

IQ

Directions (Q. 1):
A + B means 'A' is Brother of 'B'.
A – B means 'A' is Sister of 'B'.
A × B means 'A' is Father of 'B'.
A ÷ B means 'A' is Mother of 'B'.

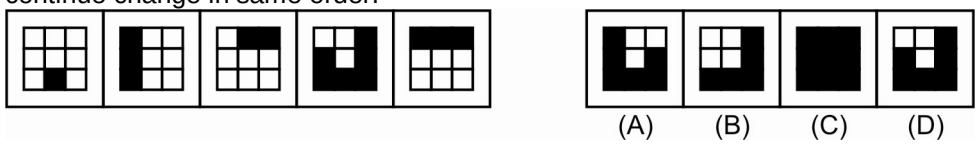
1. Which of the following represents that 'F' is father of 'W'?
   (A) F ÷ R + W (B) F + R × W
   (C) F × R – W (D) F × R ÷ W

2. B is to the South-West of A. C is to the East of B and South-East of A and D is to the North of C in line with BA. In which direction of A is D located?
   (A) East (B) North
   (C) South-East (D) North-East

3. If North is called North-West, North-West is called West, West is called South-West and so on, what will South-East be called?
   (A) West (B) South
   (C) East (D) North-East

4. If 'ACTION' is coded as ZXGRLM then 'HEALTH' will be coded in the same way as:
   (A) SVZOGS (B) TVZOGT
   (C) RUZPGR (D) QVG

5. Find out which one of the answer figure would occupy the next position in the problem figures if they continue change in same order.



Space for Rough Work

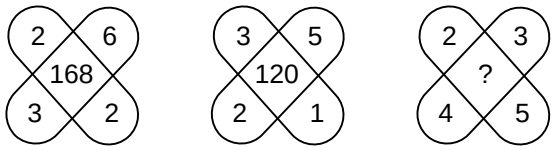
6. The train for Mumbai leaves every two and a half hours from New Delhi Railway Station. An announcement was made that the train for Mumbai had left 40 minutes ago and the next train will leave at 18:00 hrs. At what time was the announcement made?
(A) 15:30 hrs (B) 17:10 hrs
(C) 16:00 hrs (D) 16:10 hrs

7. Certain number of horses and an equal number of men are going some where. Half of the owners are on their horses back while the remaining ones are walking along leading their horses. If the number of legs walking on the ground is 70, how many horses are there?
(A) 10 (B) 12
(C) 14 (D) 16

8. Six students P, Q, R, S, T and U are sitting in the field. P and Q are from Delhi while the rest are from Chennai. S and U are tall while others are short. P, R and S are girls while others are boys. Which is the tall girl from Chennai?
(A) R (B) S
(C) T (D) U

9. A clock seen through a mirror shows quarter past four. What is the correct time shown by the clock?
(A) 9:45 (B) 9:15
(C) 8:45 (D) 7:45

10. In the given figures, numbers are written according to some patterns and one number is missing. Find the missing number that replaces the question mark.



(A) 84 (B) 195
(C) 240 (D) 200

11. The numbers have been arranged under some rule. Based on that rule which number best fits the question mark?
0, 2, 24, 252, ?
(A) 3120 (B) 1040
(C) 620 (D) 5430

Space for Rough Work

Directions (Q. 12 to 16): Four men A, B, C and D and four women P, Q, R and S are sitting around a table facing to the centre. No two males sit adjacent to each other. D is two places to the right of A and adjacent to S, who is two places to the left of P, who is adjacent to B, who in turn is not opposite to A.

12. Who is sitting opposite to S?
(A) Q (B) R
(C) A (D) Can not be determined

13. If Q sits three places away from C and B, then who sits three places to the left of D?
(A) P (B) R
(C) B (D) Can not be determined

14. If each person exchanges his/her seat with the person sitting opposite to him/her, then who sits to the immediate right of B?
(A) Q (B) S
(C) R (D) Can not be determined

15. If every man shifts by two places to his right and every woman shifts by two places to her left, then who sits adjacent to C?
(A) Q and R (B) P and S
(C) P and Q or R (D) Can not be determined

16. If D and Q exchange their seats, then which of the following conditions is not violated?
(A) No two men can sit adjacent to each other (B) D is two places to the right of A
(C) B is not opposite to A (D) All the above are violated

17. A committee of five is to be formed from five boys A, B, C, D, E and three girls P, Q, R such that at least two girls must be in committee. If C is selected, then D is selected and vice-versa. If P is selected, then Q is selected and C is not selected. Who among the following must get selected?
(A) C (B) P
(C) R (D) Q

Space for Rough Work

Directions (Q. 18 to 22): Chhota Bheem, Kalia, Raju, Jaggu, Dholu and Bholu are six students of a class. Each one has topped in one of the six different subjects viz. Mathematics, Hindi, English, History, Geography and Science but not in the order as given. Again each one has got a different overall rank i.e.
(i) The highest ranker has topped in Science.
(ii) Jaggu who is higher in rank than Dholu but lower than Chhota Bheem has topped in history.
(iii) The lowest ranker among them has topped in Mathematics.
(iv) Chhota Bheem and Dholu have topped in neither science nor geography.
(v) Bholu has topped in geography.
(vi) Bholu in order of rank is lower than Dholu, who has topped in Hindi and higher than Raju.

18. Who has topped in Science?
(A) Chhota Bheem (B) Kalia
(C) Jaggu (D) None of these

19. Who among them has the lowest rank?
(A) Chhota Bheem (B) Kalia
(C) Jaggu (D) None of these

20. Which subject has Chhota Bheem topped in?
(A) Mathematics (B) English
(C) Hindi (D) None of these

21. Which rank does Bholu hold among the six students?
(A) First (B) Second
(C) Third (D) Fifth

22. Which subject has Dholu topped in?
(A) Mathematics (B) English
(C) Hindi (D) None of these

Space for Rough Work

Section-II

Science and Mathematics (PCMB)

Physics (Part – A)

23. Weight of a body is maximum at the
(A) Poles (B) equator
(C) Centre of the earth (D) top of mountains

24. Which of the following types of forces is not contact force?
(A) muscular force (B) Frictional force
(C) magnetic force (D) none of these

25. The method of purifying metals by passing electricity is called
(A) Electrolysis (B) Electroplating
(C) Electro refining (D) chemical effects

26. Sound can not travel through
(A) air (B) water
(C) vacuum (D) steel

27. Low frequency sounds which we can not hear are called
(A) Amplified sounds (B) Rectified sounds
(C) Ultrasonic sounds (D) Infrasonic sounds

Space for Rough Work

Chemistry (Part – B)

28. Coal gas is a mixture of:
(A) CO and H_2 only
(B) H_2, saturated and unsaturated hydrocarbons, CO, CO_2, N_2 and O_2
(C) Saturated and unsaturated hydrocarbons only
(D) CO, CO_2 and CH_4 only

29. Which one of the following fibres are made up of polyamides?
(A) Dacron (B) Orlon
(C) Nylon (D) Rayon

30. Among the following polymers, the weakest molecular forces are present in
(A) Thermosetting plastics (B) Fibres
(C) Thermoplastics (D) Rubber

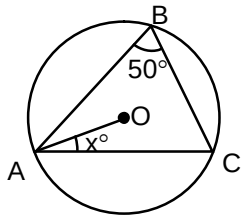
31. Which of the following elements belongs to the group that includes the most active metals?
(A) Aluminium (B) Sodium
(C) Iron (D) Mercury

32. Orlon is a polymer of
(A) PVC (B) Bakelite
(C) Acrylonitrile (D) Nylon

Space for Rough Work

Mathematics (Part – C)

33. In the given figure, O is the centre of circle.
If $\angle ABC = 50°$, then the value of x is
(A) 45°
(B) 50°
(C) 40°
(D) none of these



34. The smallest number by which 2646 must be multiplied to obtain a perfect square is
(A) 6 (B) 4
(C) 3 (D) 5

35. The value of $\sqrt[3]{\frac{343}{-1000}}$ is
(A) $-\frac{7}{10}$ (B) $\frac{17}{10}$
(C) $\frac{7}{10}$ (D) $-\frac{17}{10}$

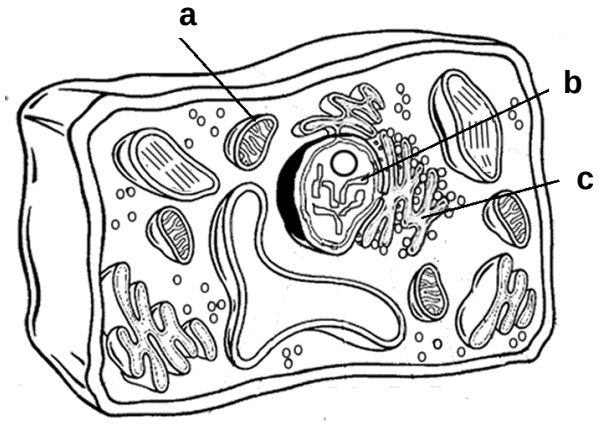
36. If $p^2 + q^2 + r^2 = 20$ and $pq + qr + rs = 15$, then the value of $p + q + r$ is
(A) $4\sqrt{2}$ (B) $2\sqrt{2}$
(C) 5 (D) $5\sqrt{2}$

37. The value of x in the equation $\frac{2x-13}{5} - \frac{x-3}{11} = \frac{x-9}{5} + 1$ is
(A) 12 (B) 15
(C) 17 (D) 14

Space for Rough Work

Biology (Part – D)

38. Name the structures labelled with a, b and c.



(A) a – Nucleus, b – Endoplasmic Reticulum, c – Chloroplast
(B) a – Nucleus, b – Chromosome, c – Golgi body
(C) a – Mitochondria, b – Chromosome, c – Endoplasmic Reticulum
(D) a – Mitochondria, b – Chromosome, c – Golgi body

39. Some viruses have RNA but no DNA. This indicates that :
(A) They cannot replicate
(B) These viruses do not have heritable information
(C) RNA can transmit hereditary information
(D) Their nucleic acids must combine with host DNA for virus duplication

40. The vector which spreads sleeping sickness is :
(A) Housefly (B) Tse - Tse fly
(C) *Adese* mosquito (D) *Culex* mosquito

41. Match the terms in column-I with suitable terms in column-II :

Column – I		Column – II	
(a)	Water pollution	(1)	Acid rain
(b)	Mathura refinery	(2)	PAN
(c)	Methyl isocyanate	(3)	MPN
(d)	Secondary pollutants	(4)	Shock waves
(e)	Sonic booms	(5)	Bhopal tragedy

(A) (a $\rightarrow$ 1), (b $\rightarrow$ 2), (c $\rightarrow$ 5), (d $\rightarrow$ 3), (e $\rightarrow$ 4) (B) (a $\rightarrow$ 4), (b $\rightarrow$ 3), (c $\rightarrow$ 5), (d $\rightarrow$ 1), (e $\rightarrow$ 2)
(C) (a $\rightarrow$ 1), (b $\rightarrow$ 3), (c $\rightarrow$ 4), (d $\rightarrow$ 5), (e $\rightarrow$ 2) (D) (a $\rightarrow$ 3), (b $\rightarrow$ 1), (c $\rightarrow$ 5), (d $\rightarrow$ 2), (e $\rightarrow$ 4)

42. Fertigation is :
(A) Sprinkler irrigation system (B) River life system
(C) River valley system (D) Applying fertilizers through drip irrigation

Space for Rough Work

Section-III Science & Mathematics (PCM)

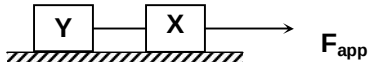
Physics (Part – A)

43. A wave on a long spring has frequency f, wavelength λ and speed v. The tension in the spring is changed. A new wave on the spring has three times frequency and twice the wavelength. The new wave speed is
(A) 6v (B) 3v
(C) 2v (D) v

44. An electrochemical cell which generates an electric current is called
(A) Volta meter (B) Ammeter
(C) Voltmeter (D) voltaic cell

45. If a weighing scale on Earth shows your weight as 585 N. What is your mass?
(A) 585 kg (B) 58.5 kg
(C) 70 kg (D) 40 kg

46. Blocks X and Y are attached to each other by a light rope and can slide along a horizontal, rough surface. Block X has



a mass of 10 kg and block Y a mass of 5 kg. An applied force of 36 N [right] acts on block X. Suppose the magnitude of the force of friction on blocks X and Y are 8N and 4N respectively. The magnitude of tension in the string between the blocks is
(A) 36 N (B) 4 N
(C) 12 N (D) 18 N

47. Two athletes A and B in a team are practising to compete in a boat race. Athlete A has a mass of 70 kg, B a mass of 75 kg and the boat has a mass of 20 kg. Athlete A can exert an average force of 400 N [forward] and B an average force of 420 N [forward] on the boat using paddles. During paddling the magnitude of water resistance on the boat is 380 N. The initial acceleration of the boat is
(A) 2.0 m/s^2 (B) 1.5 m/s^2
(C) 2.7 m/s^2 (D) 3.5 m/s^2

48. Three small metal cubes have a mass of 20 g each. One cube is of aluminium (density = 2.7 g/cm^3), one is of brass (density = 8.5 g/cm^3) and one is of lead (density = 11.4 g/cm^3). Which cube when dropped into a beaker of water, will result in the greatest rise in the water level?
(A) All will cause the same rise in water level
(B) Aluminium
(C) Brass
(D) Lead

Space for Rough Work

Chemistry (Part – B)

49. Which one of the following fractions of petroleum has the lowest boiling point?
(A) Kerosene (B) Diesel
(C) Petrol (D) L.P.G

50. Asphalt is used for /as
(A) Aviation fuel (B) Making road surfaces
(C) Running water pumps (D) Dry cleaning of clothes

51. Terylene is a condensation polymer of ethylene glycol and
(A) Benzoic acid (B) Phthalic acid
(C) Salicylic acid (D) Terephthalic acid

52. If an element is a gas at room temperature, then it must be a/an
(A) Alkali Metal (B) Nonmetal
(C) Halogen (D) Alkaline Earth Metal

53. When sodium chloride is dissolved in water, sodium ion is
(A) Oxidised (B) Reduced
(C) Hydrolysed (D) Hydrated

54. When a mixture of air and steam is passed over red hot coke the outgoing gas contains
(A) Producer gas (B) Water gas
(C) Coal gas (D) Mixture of (A) & (B)

Space for Rough Work

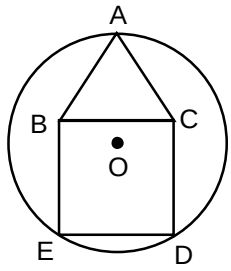
Mathematics (Part – C)

55. One of the angles of a triangle is equal to the sum of the other two angles. If the ratio of the other two angles is 5 : 4, then the smallest angle of the triangle is
(A) 40° (B) 50°
(C) 30° (D) 45°

56. The value of $\sqrt{5+\sqrt{11+\sqrt{19+\sqrt{29+\sqrt{49}}}}}$ on simplifying is
(A) 3 (B) 2
(C) 1 (D) 4

57. The factor of $(p + q)^2 - (p - q)^2$ is
(A) 2 pq (B) 4 pq
(C) p + q (D) p – q

58. In the adjoining diagram, ABC is an equilateral triangle and BCDE is a square having each side 10 cm, then the radius of the circle is (in cm)
(A) $10\sqrt{2}$
(B) $10\sqrt{3}$
(C) 10
(D) 12



59. If $x + \frac{1}{x} + 2 = 0$, then the value of $x^{33} + x^{32} + x^{13} + x^{12} + x + 1$ is
(A) 2 (B) 0
(C) 3 (D) 4

60. ABCD is a parallelogram in which diagonals AC and BD intersect at point O. If $\angle BAO = 20°$, $\angle COD = 133°$, then the value of $\angle ODC$ is
(A) 25° (B) 22°
(C) 35° (D) 27°

Space for Rough Work

FIITJEE TALENT REWARD EXAM

(FTRE-2013)

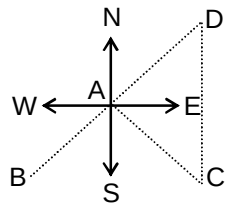
CLASS VIII

HINTS (SET-A)

PAPER-2

1. (C) F × R – W
F × R means F is father of R and R – W means R is sister of W. i.e. F is father of W.

2. (D) D is the North-East of A.



3. (C) If north is called North-West, North-West is called west and so on. i.e. every direction moves 45º in anticlockwise direction. So east is called South-East.

4. (A) ACTION $\rightarrow$ ZXGRLM
Alphabet rank from starting is coded same rank from end. So, HEALTH $\rightarrow$ SVZOGS.

5. (C) Every second figure is three times shaded the first figure with next square.

6. (D) The train for Mumbai leaves every two and a half hours. The announcement made (18:00 – 2:30) – 40 min. = 16 : 10 hrs.

7. (C) Let total number of men = x
So, total number of horses = x

$$4 \times \frac{x}{2} + \boxed{\frac{x}{2}} \times 6 = 70$$

$$2x + 3x = 70$$

$$5x = 70$$

$$\boxed{x = 14}$$

8. (B)

P	Q	R	S	T	U
Delhi	Delhi	Chennai	Chennai	Chennai	Chennai
Girl	Boy	Girl	Girl	Boy	Boy

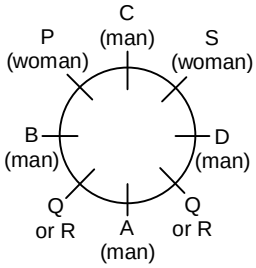
S and U are tall while others are short. So, S is the tall girl from Chennai.

9. (D) (11 : 60 – 4 : 15) = 7 : 45.

10. (B) $(2 + 6 + 2 + 3)^2 - 1 = (13)^2 - 1 = 168$
Similarly $(2 + 3 + 5 + 4)^2 - 1 = (14)^2 - 1 = 196 - 1 = 195$.

11. (A) $1^1 - 1, 2^2 - 2, 3^3 - 3, 4^4 - 4, 5^5 - 5$.

Directions (Solutions for 12 to 16):



12. (D)

13. (B)

14. (D)

15. (A)

16. (C)

17. (D)

Directions (Solutions for 18 to 22):

Rank Order

Kalia	>	Chhota Bheem	>	Jaggu	>	Dholu	>	Bholu	>	Raju
(science)		(English)		(History)		(Hindi)		Geography		(Maths)

18. (B)

19. (D)

20. (B)

21. (D)

22. (C)

23. As acceleration due to gravity is maximum at poles so weight of the body is also maximum

24. As no physical contact between bodies is involved in magnetic force. So it is not a contact force.

25. The method of purifying metals by passing electricity is called Electro refining.

26. sound requires medium for propagation

27. Low frequency sounds which we can not hear are called Infrasonic sounds.

28. Coal gas contains H_2, saturated and unsaturated hydrocarbons, CO, CO_2, N_2 and O_2.

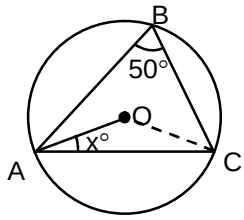
29. Nylon is a polymer of amide units.

30. Weakest forces are present in rubber.

31. Alkali metals are most reactive metals.

32. Orlon is a common name of polyacrylonitrile.

33. Join O to C
In ΔOAC, OA = OC
$\therefore \angle OAC = \angle OCA = x$
$\therefore AOC = 50^o \times 2 = 100^o$
$\therefore x + x + 100° = 180°$
$2x = 80°$
$x = 40°$



34.
2|2646
3|1323
3|441
3|147
7|49
7
$\therefore$ This should be multiplied by $2 \times 3 = 6$ to make it perfect square.

35. $\sqrt[3]{\frac{343}{-1000}} = \sqrt[3]{\frac{7 \times 7 \times 7}{-10 \times -10 \times -10}} = \frac{-7}{10}$

36. $(p + q + r)^2 = p^2 + q^2 + r^2 + 2(pq + qr + rs)$
$= 20 + 2 \times 15 = 50$
$\therefore p + q + r = \sqrt{50} = 5\sqrt{2}$.

37. $\frac{22x - 143 - 5x + 15}{55} = \frac{x - 9 + 5}{5}$
$\frac{17x - 128}{55} = \frac{x - 4}{5}$
$17x - 128 = 11x - 44$
$17x - 11x = -44 + 128$
$6x = 84$
$x = \frac{84}{6} = 14$.

38. **a** represents mitochondria which are power house of the cell.
b represents chromosomes which are involved in transmission of genetic information from one generation to another.
c endoplasmic reticulum which are involved in membrane biogenesis.

39. RNA also act as hereditary material.

40. Sleeping sickness is caused by *Trypanosoma* and Tse-Tse fly acts as a vector.

41. PAN – Peroxyacetyl nitrate.
MPN – Most probable number.

42. Fertigation is applying fertilizers through drip irrigation.

43. $v = f\lambda$
$v' = 3f \times 2\lambda = 6\, f\lambda = 6v$

44. An electrochemical cell which generates an electric current is called voltaic cell.

45. $m = \frac{F}{g} = \frac{585}{10} = 58.5$

46. $F_{net} = 36. - 12 = 24\ N$
$a = \frac{F_{net}}{M_T} = \frac{24}{15} = 1.6\ m/s^2$
$T - 4 = 5 \times 1.6 \Rightarrow T = 12\ N$

47. $m_T = 70 + 75 + 20 = 165\ kg$
$F_{net} = 400 + 420 - 380 = 440\ N$
$a = \frac{F_{net}}{m_T} = \frac{440}{165} = 2.7\ m/s^2$

48. $m_{A\ell} = V_{A\ell}\rho_{A\ell}$
$\Rightarrow V_{A\ell} = \frac{20}{2.7} = \frac{200}{27} = 7.4\ cm^3$
$V_{br} = \frac{20}{8.5} = 2.35\ cm^3$
$V_{\ell d} = \frac{20}{11.4} = 1.75\ cm^3$

49. L.P.G is vaporized first among these four as it has lowest boiling point.

50. Asphalt is also known as bitumen which is used for road surfacing.

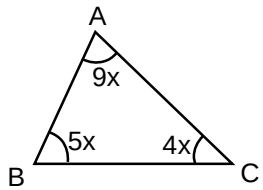
51. Terylene is a condensation polymer of ethylene glycol and terephthalic acid.

52. Except mercury all metals exist in solid state at room temperature.

53. When water is used as the solvent to dissolve any compound, the process is called hydration.

54. Coke + Steam $\longrightarrow$ water gas
Coke + Air (Oxygen and Nitrogen) $\longrightarrow$ producer gas

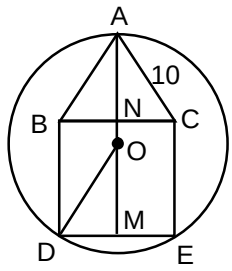
55. $9x + 5x + 4x = 180°$
$18x = 180°$
$x = 10°$
$\therefore \angle C = 4 \times 10° = 40°$



56. $\sqrt{5+\sqrt{11+\sqrt{19+\sqrt{29+7}}}}$
$\sqrt{5+4} = 3.$

57. $(p + q + p - q)(p + q - p + q)$
$= 2p \times 2q = 4pq.$

58. In ΔANC,
$AN = \sqrt{10^2 - 5^2} = \sqrt{75} = 5\sqrt{3}$
$\therefore AM = 10 + 5\sqrt{3}$.
$OD = r$
$OM = \left(10 + 5\sqrt{3} - r\right)$
$DM = 5$
Now, in ΔOMD applying Pythagoras Theorem
$(OD)^2 = (OM)^2 + DM^2$
$r^2 = \left(10 + 5\sqrt{3} - r\right)^2 + 5^2$
Solving, r = 10 cm.



59. $x + \frac{1}{x} + 2 = 0$
$x^2 + 2x + 1 = 0$
$(x + 1)^2 = 0$
$x + 1 = 0$
$\therefore x^{32}(x + 1) + x^{12}(x + 1) + 1(x + 1)$
$= 0 + 0 + 0 = 0.$

60. $\angle OCD = \angle OAB = 20°$
In ΔOCD,
$133° + 20° + \angle ODC = 180°$
$\therefore \angle ODC = 27°.$