020106 A

Question Booklet Series: **A**

Polytechnic Written Test– 2014
QUESTION BOOKLET

INSTRUCTIONS

Question Booklet Number: 102248

Maximum Time Allowed : 3 Hours
Negative Marking : 0.2

No. of Questions: 180
Maximum Marks: 180

Roll Number: | | | | | | | Answer Sheet Number: | | | | | | |

Please read the following instructions carefully:

1) **Check the booklet thoroughly**: In case of any defect – Misprint, Missing question(s) or duplication of question(s) / Page(s), get the booklet changed with the booklet of the same series from the Room Invigilator. No complaint shall be entertained after the entrance test.

2) Write your Roll Number and the OMR Answer Sheet Number on the question booklet.

3) Mark carefully your Roll Number, Question Booklet Number and Question Booklets series on OMR Answer sheet and sign at the appropriate place. Incomplete and/or incorrect particulars will result in the non-evaluation of your answer sheet.

4) Strictly follow the instructions given by the Centre Supervisor / Room Invigilator and those given on the Question Booklet.

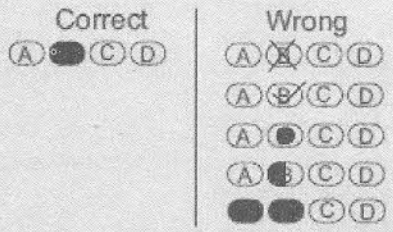
5) Candidates are not allowed to carry any papers, notes, books, calculators, cellular phones, scanning devices, pagers etc. to the Examination Hall. Any candidate found using, or in possession of such unauthorized material, indulging in copying or impersonation or adopting unfair means / reporting late / without Admit Card will be debarred from the written test.

6) Please mark the right responses on the OMR Sheet with ONLY a Blue/Black ball point pen. Use of eraser, whitener (fluid) and cutting on the OMR Answer Sheet is NOT allowed.

7) The test is of objective type containing multiple choice questions (MCQs). Each objective question is followed by four responses. Your task is to choose the correct/best response and mark your response on the OMR Answer Sheet and NOT on the Question Booklet.

8) There will be 0.2 negative marking for every wrong answer.

9) For marking response to a question, completely darken the CIRCLE so that the alphabet inside the CIRCLE is not visible. Darken only ONE circle for each question. If you darken more than one circle, it will be treated as wrong answer. The CORRECT and the WRONG methods of darkening the CIRCLE on the OMR Answer Sheet are shown below.



10) Please be careful while marking the response to questions. The response once marked cannot be changed and if done shall be treated as wrong answer.

11) In view of the tight time span, do NOT waste your time on a question which you find to be difficult. Attempt easier questions first and come back to the difficult questions later during the test.

12) DO NOT make any stray marks anywhere on the OMR Answer Sheet. DO NOT fold or wrinkle the OMR answer sheet.

13) Rough work MUST NOT be done on the OMR Answer Sheet. Use your test booklet for this purpose.

14) Candidates are provided carbonless OMR Answer Sheet having original copy and candidate's copy. After completing the examination, candidates are directed to fold at perforation on the top of the sheet, tear it to separate original copy and candidate's copy and then hand over the original copy of OMR Answer Sheet to the Room Invigilator and take candidate's copy with them.

DO NOT OPEN THE SEAL OF THIS BOOKLET UNTIL TOLD TO DO SO

Section 1 - English

1. Complete the sentence with the suitable pronoun:

   When I discovered as a young man that my freedom had already been taken from _____, then I began to hunger for it.
   (A) I
   (B) Myself
   (C) Me
   (D) Mine

2. Complete the sentence with the suitable modal auxiliary verb:

   I had no radio, no compass, and I _____ see where I was.
   (A) Should not
   (B) May not
   (C) Could not
   (D) Would not

3. Complete the sentence with the correct answer:

   That evening, after I _____ the rest of my homework, the note about the essay caught my eye.
   (A) Had been finishing
   (B) Would be finishing
   (C) Had finished
   (D) Was finished

4. Complete the sentence with the suitable idiomatic expression:

   Look how she _____ into our conversation, just as though she were a grown lady."
   (A) Puts her nose
   (B) Pokes her nose
   (C) Inserts her nose
   (D) Pinches her nose

5. Choose the correct reported statement:

   Natalya: "Papa, please tell this gentleman who owns Oxen Meadows"
   (A) Natalya asked her father to please tell that gentleman who owned Oxen Meadows.
   (B) Natalya requested her father to tell that gentleman who owns Oxen Meadows.
   (C) Natalya requested her father to tell that gentleman, who owned Oxen Meadows.
   (D) Natalya requests her father to tell that gentleman who the owner of Oxen Meadows was.

6. Complete the sentence with the suitable modal auxiliary verb:

   There were drawings all over the room-there _____ a hundred of them, all lined up.
   (A) Would have been
   (B) Needed to be
   (C) May have been
   (D) Must have been

7. Place the adverb at the appropriate position:

   She was getting good ideas for her drawings. (probably)
   (A) She was getting probably good ideas for her drawings.
   (B) She was probably getting good ideas for her drawings.
   (C) She was getting good probably ideas for her drawings.
   (D) She was getting good ideas for her probably drawings.

8. Choose the correct word to complete the sentence:

   She sat in the corner of the room _____ the rough boys who did NOT make good marks sat.
   (A) Which
   (B) Whom
   (C) When
   (D) Where

9. Complete the sentence with the suitable pronoun:

   The oppressed and the oppressor alike are robbed of _____ humanity.
   (A) His
   (B) One's
   (C) Their's
   (D) Their

10. Complete the sentence with the suitable pronoun:

    A wedding toast is a custom _____ a close friend or relative of the groom or the bride says a few words to wish the couple.
    (A) When
    (B) That
    (C) Where
    (D) Whom

11. Choose the correct reported statement:

"Do you know that over eighty crore cups of tea are drunk every day throughout the world?" Rajvir said.

(A) Rajvir asked if he knew that over eighty crore cups of tea are drunk every day throughout the world.
(B) Rajvir wanted to know if he knows that over eighty crore cups of tea were drunk every day throughout the world.
(C) Rajvir consulted if he had known that over eighty crore cups of tea are drunk every day throughout the world.
(D) Rajvir enquired of his friend if he knows that over eighty crore cups of tea are drunk every day throughout the world.

12. Complete the sentence with the suitable pronoun:

He closed one eye, then _____, and pretended to fall asleep.

(A) The another
(B) The other
(C) Other
(D) The other's

13. Complete the sentence with the suitable conjunction:

That was twenty-four hours ago. _____ nobody had come near him.

(A) Even if
(B) Since then
(C) After
(D) Nor

14. Complete the sentence with the suitable conjunctions:

"Hey, let's go and see ____ that kid has left town _____ not."

(A) Whether, And
(B) If, Yet
(C) Although, Or
(D) If, Or

15. Complete the sentence with the suitable modal auxiliary verb:

He felt certain that his wings _____ never support him.

(A) Would
(B) Will
(C) Should
(D) Ought to

16. Complete the sentence with the suitable conjunction:

She and Maddie went around to the back yard and knocked there. _____ there was no answer

(A) Neither
(B) Still
(C) While
(D) So that

17. Complete the sentence with the correct answer:

Days passed and there was no answer, but the letter did NOT come back, so maybe Wanda _____ it.

(A) Received
(B) Would receive
(C) Might receive
(D) Had received

18. Complete the sentence with the suitable modal auxiliary verb:

She _____ never _____ paid any attention to Wanda if Peggy hadn't invented the dresses game.

(A) Would, Have
(B) Can, Have
(C) May, Have
(D) Will, Have

19. Complete the sentence with the correct preposition:

It was Christmas time and there was snow ___ the ground.

(A) In
(B) Over
(C) On
(D) At

20. Complete the sentence with the correct answer:

I carried it to my bedroom to read, and there, _____ on the floor, were two Arabs

(A) Squatted
(B) Squatting
(C) Had squatted
(D) Were squatting

21. Choose the correct reported statement:

Anne Frank: "Maybe it's my fault that we don't confide in each other".

(A) Anne Frank states that it may be her fault that we don't confide in each other.
(B) Anne Frank remarked that it might be her fault that they did not confide in each other.
(C) Anne Frank opined that it might be her fault that they did not confided in each other.
(D) Anne Frank opines that it might be her fault that they do not confide in each other.

22. Complete the sentence with the correct answer:

He spent hours _____ a rubber ball round the room like a four-footed soccer player

(A) To shuffling
(B) To shuffle
(C) Shuffling
(D) To have shuffled

23. Complete the sentence with the suitable conjunction:

Miss Mason read it several times _____ studied it thoughtfully for a while.

(A) But
(B) Yet
(C) And
(D) Or

24. Complete the sentence with the correct answer:

I'm very liable _____ my temper.

(A) Losing
(B) To losing
(C) For losing
(D) To lose

25. Choose the correct word to complete the sentence:

She wanted to ride on that bus, _____ just once.

(A) In order that
(B) While
(C) Till
(D) Even if

26. Complete the sentence with the correct answer:

If only she could tell Wanda, she ___not meant to hurt her feelings!

(A) Could
(B) Had
(C) Would
(D) Did

27. Complete the sentence with the suitable collocation:

Mij quickly developed certain _____ habits on these walks in the London streets.

(A) Compulsive
(B) Compulsory
(C) Compelling
(D) Forcing

28. Complete the sentence with the correct phrasal verb:

The bus rolled on, now _____ a bare landscape.

(A) Cutting across
(B) Cutting into
(C) Cutting by
(D) Cutting off

29. Complete the sentence with the correct adjective:

Those age-old, _____ furnaces still exist.

(A) Time-testing
(B) Timely-tested
(C) Time-tasted
(D) Time-tested

30. Choose the correct word to complete the sentence:

_____ I got there, he was up on the end of the bathtub and fumbling at the chromium taps with his paws.

(A) Whereas
(B) As long as
(C) By the time
(D) Unless

Section 2 - Physics

31. The fuel obtained by the sources of animal and plant products is called
(A) Bio mass
(B) Thermal energy
(C) Charcoal
(D) Wind energy

32. What does electric charges in uniform motion produce?
(A) Only electric fields
(B) Only magnetic fields
(C) Both electric and magnetic fields
(D) No field at all

33. What is the total area of the land required by the wind energy firm to establish 1 MW generator?
(A) 4 hectares
(B) 2 hectares
(C) 3 hectares
(D) 5 hectares

34. What is the name of the transparent membrane through which the light enters the eye?
(A) Retina
(B) Cornea
(C) Ciliary muscles
(D) Pupil

35. Which one of the following energy is formed on the basis of gravity of earth?
(A) Geothermal energy
(B) Solar energy
(C) Bio-mass
(D) Nuclear energy

36. What is the size of the image formed by a concave mirror, when the object is placed at focus?
(A) Highly enlarged
(B) Diminished
(C) Point sized
(D) Same size as the object

37. What is the value of magnetic field inside a solenoid?
(A) Non uniform
(B) Zero
(C) Same at all points
(D) Variable

38. When an object is placed 15 cm away from a concave mirror, its real image is formed at a distance of 50 cm from the mirror. What is the focal length of the mirror?
(A) -11.5 cm
(B) -12 cm
(C) -15 cm
(D) 13 cm

39. What happens to the spacing between the magnetic field lines when we move away from a current carrying conductor?
(A) Decreases
(B) Increases
(C) Remains at equal distance
(D) Zero

40. If two resistor of resistance R1 =10 Ω and R2=20 Ω are connected in series and a battery of 6 V is connected across the combination, what is the current through the circuit?
(A) 0.2 Amp
(B) 30 Amp
(C) 10 Amp
(D) 20 Amp

41. What is the Refractive Index of glass, if the angle of incidence of ray of light on the glass surface is 45^{o} and the angle of refraction is 30^{o}?
(A) 1.5
(B) 1.65
(C) 1.414
(D) 1.33

42. How fast does light travel in a water of Refractive Index 1.33?
(A) 2.25×10^{8} m/s
(B) 3×10^{8} m/s
(C) 2×10^{8} m/s
(D) 4×10^{8} m/s

43. Which law gives the direction of the magnetic field?
(A) Ohm's law
(B) Right hand thumb rule
(C) Kirchhoff's Circuit law
(D) Faraday's law

44. What is the name of the power plant which converts the potential energy of falling water into electricity?
(A) Nuclear plant
(B) Hydro power plant
(C) Thermal power plant
(D) Wind power plant

45. Which phenomenon is responsible for the twinkling of stars?
(A) Total internal reflection
(B) Atmosphere refraction
(C) Atmosphere reflection
(D) Dispersion

46. What are the energy sources which eventually run out are called?
(A) Renewable resources
(B) Endangered resources
(C) Natural resources
(D) Non renewable resources

47. What is the focal length of a convex mirror whose radius of curvature is 24 cm?
(A) 12 cm
(B) 24 cm
(C) 6 cm
(D) 36 cm

48. If the Resistors R1 = 1 Ω, R2 = 4 Ω, R3 = 3 Ω, R4 = 2 Ω, R5 = 6 Ω are connected in series across a battery of voltage 12 V, what is the current in the circuit?
(A) 1.2 A
(B) 0.75 A
(C) 0.5 A
(D) 16 A

49. Which part of the eye regulates and controls the amount of light entering the eye?
(A) Iris
(B) Retina
(C) Pupil
(D) Cornea

50. A potential difference of 300 V is applied across a resistance of 500 Ω. What is the Heat energy produced in the resistance in 5 s?
(A) 450 J
(B) 300 J
(C) 500 J
(D) 900 J

51. What should be the wind speed at places where wind energy farms can be established?
(A) More than 15 km/hr
(B) Less than 10 km/hr
(C) It can be established anywhere
(D) Wind speed is 5 km/hr

52. What is the power of a lens of focal length 25 cm?
(A) 4 D
(B) 5 D
(C) 0.5 D
(D) 0.2 D

53. What is the name of the instrument used to change the resistance of the circuit?
(A) Ammeter
(B) Voltmeter
(C) Rheostat
(D) Galvanometer

54. If a filament of an electric bulb draws a current of 0.5 A for 6 minutes, what is the amount of electric charge that flows through the circuit?
(A) 50 C
(B) 180 C
(C) 360 C
(D) 100 C

55. If a current is passed through a straight wire, what is the shape of magnetic field lines around it?
(A) Circular and endless
(B) Straight lines
(C) Oval in shape and endless
(D) Cylindrical in shape

56. What is the principle of Electric Generator?
(A) Electromagnetic induction
(B) Ohm's law
(C) Super conductivity
(D) Kirchhoff's law

57. What is the speed of light in a glass medium of Refractive Index 1.65?
(A) 1.85×10^8 m/s
(B) 1.818×10^8 m/s
(C) 1.75×10^8 m/s
(D) 3×10^8 m/s

58. A wire of given material having length L and area of cross section A has a resistance of 4 Ω. What happens to the resistance of the same wire when the length is decrease by 1/4 times and area of cross section increased to 4A?
(A) 0.2 Ω
(B) 4 Ω
(C) 0.0625 Ω
(D) 0.05 Ω

59. What would be the focal length of a lens that produces a real image four times as large as the object, if the distance between the object & image is 2 cm?
(A) -15/8 cm
(B) -15/4 cm
(C) -8/25 cm
(D) -12/5 cm

60. Which form of energy is converted into electrical energy in thermal power plants?
(A) Heat energy
(B) Wind energy
(C) Nuclear energy
(D) Mechanical energy

61. How many electrons per second pass through a given point in a wire carrying a current of 4 Amperes?
(A) 2.5×10^{19} electrons
(B) 1.6×10^{19} electrons
(C) 1.6×10^{-19} electrons
(D) 2.5×10^{-19} electrons

62. An electric iron has a rating of 500 W, 220 V. What is the resistance of the iron when in use?
(A) 100 Ω
(B) 96.8 Ω
(C) 220 Ω
(D) 500 Ω

63. A converging lens has a focal length of 20 cm. An object is placed 80 cm from the lens. What is the magnification produced?
(A) 1/4
(B) 1/3
(C) 3
(D) 4

64. Which is the gas responsible for producing green house effect?
(A) Helium
(B) Oxygen
(C) Carbon dioxide
(D) Nitrogen

65. A wire of resistance 2 ohms is stretched until its length becomes 4 times its original length. What is the resistance of the wire?
(A) 3 Ω
(B) 32 Ω
(C) 4 Ω
(D) 16 Ω

66. At the time of short circuit, what happens to the current in the circuit?
(A) Reduces substantially
(B) Does not change
(C) Increases heavily
(D) Vary continuously

67. What is the frequency of AC in India?
(A) 60 Hz
(B) 40 Hz
(C) 220 Hz
(D) 50 Hz

68. If a charge of 6 C moves between two plates maintained at a potential difference of 2 V. What is the energy acquired by the charge?
(A) 2 J
(B) 6 J
(C) 12 J
(D) 3 J

69. What is the name of the device that converts electrical energy to mechanical energy?
(A) Electric motor
(B) Ammeter
(C) Voltmeter
(D) Galvanometer

70. If a person CAN NOT see objects clearly beyond 50 cm, what is the power of the lens that the person has to use to correct vision?
(A) +5 D
(B) -0.5 D
(C) -2 D
(D) +2 D

Section 3 -Chemistry

71. Which of the following statement is incorrect for an ionic solid?
    (A) Ionic solids exhibits high melting point
    (B) Ionic solids are highly brittle
    (C) Ionic solids are good electrical conductors
    (D) Ionic solids are soluble in water
72. Ionic bond exists between which of the following?
    (A) Na and Na
    (B) Mg and Cl
    (C) Cl and Cl
    (D) Na and OH
73. Among the following which one is NOT a diatomic molecule?
    (A) Boron
    (B) Nitrogen
    (C) Oxygen
    (D) Hydrogen
74. Glucose solution is a non conductor of electricity because
    (A) It is insoluble in water
    (B) It is soluble in water
    (C) It does not give out free H+ ions into the solution
    (D) It liberates hydrogen gas when electricity is passed
75. What happens when a base is mixed with water?
    (A) Heat is consumed
    (B) Heat is liberated
    (C) It will be highly explosive
    (D) No change in temperature is observed
76. The heaviest atom is
    (A) Rb
    (B) U
    (C) Ra
    (D) Hg
77. How much % of acetic acid is present in vinegar?
    (A) 2 %
    (B) 3 -5%
    (C) 5 - 8%
    (D) 4 -8%
78. Why diamond is a non-conductor of electricity?
    (A) It is crystalline in nature
    (B) There are only carbon atoms present
    (C) There are no free electrons
    (D) Its structure is very compact
79. What are Micelles?
    (A) Cluster of soap molecules surrounding the dirt particle
    (B) Drops of oil or dirt that surrounds the molecule
    (C) A tadpole shaped fatty acid
    (D) Soap molecules in clean water
80. What is the order of reactivity of Al, Cu, Fe, and Mg & Zn with hydrochloric acid?
    (A) Mg > Al > Zn > Fe > Cu
    (B) Al > Cu > Fe > Mg > Zn
    (C) Cu > Fe > Zn > Al > Mg
    (D) Al > Mg > Cu > Zn > Fe
81. What is the kind of the reaction that takes place between sodium sulphate and barium chloride?
    (A) Decomposition
    (B) Direct combination
    (C) Single displacement
    (D) Double displacement
82. Who has given the Law of Triads?
    (A) Dobereiner
    (B) Mendleef
    (C) Newlands
    (D) None of these
83. What does the sign ↓ in a chemical reaction indicate?
    (A) Formation of precipitate
    (B) Dissolution of gas
    (C) Release of gas
    (D) Lowering of temperature
84. What is the example of a chemical change?
    (A) Formation of clouds
    (B) Glowing of an electric light
    (C) Dissolving of salt in water
    (D) Dropping sodium into water
85. Universal indicator is the one
    (A) Which indicates anything in the universe
    (B) Which has a wide range of pH
    (C) Which indicates the pH range from 0 to 14
    (D) Which is used to measure the acidity of all acids
86. Which of the following is true for both alkenes and alkynes?
    (A) Saturated aliphatic hydrocarbon
    (B) Cyclic hydrocarbon
    (C) Unsaturated aromatic hydrocarbon
    (D) Unsaturated aliphatic hydrocarbon

87. Rust is
(A) Copper oxide
(B) Sodium oxide
(C) Iron oxide
(D) Silver oxide

88. Which is the correct aliphatic hydrocarbon with molecular formula C_9H_{16}?
(A) An alkyne
(B) An alkene
(C) An alkane
(D) Acyclic

89. What is the structure of ethene molecule?
(A) Linear
(B) Planar
(C) Non Planar
(D) All of these

90. Which statement is correct about the modern periodic table?
(A) It has 18 vertical columns known as Groups
(B) It has 7 horizontal rows known as Groups
(C) It has 18 horizontal rows known as periods
(D) It has 7 vertical columns known as periods

91. Which gas is liberated when zinc is reacted with NaOH?
(A) Gaseous sodium
(B) Gaseous zinc
(C) Water vapour
(D) Hydrogen

92. What is the general formula of alkenes?
(A) C_nH_{2n-2}
(B) C_nH_{2n+2}
(C) C_nH_{2n}
(D) C_nH_n

93. Among the following which one is the correct way of indicating a reaction or product in an aqueous solution?
(A) (aq)
(B) (l)
(C) (Dissolved state)
(D) None of these

94. Which statement is incorrect about carbon compound?
(A) They have low melting and boiling points
(B) They form homologous series
(C) They are generally soluble in organic solvents
(D) They are ionic in nature

95. Why alkali metals are most reducing metal?
(A) These are metals
(B) Their ionization potentials are very low
(C) These are monovalent
(D) Their atomic radii are large

96. Which is the correct statement about the reaction $Fe(S) + CuSO_4\ (aq) \rightarrow FeSO_4\ (aq) + Cu(s)$?
(A) Iron is less reactive than copper
(B) Copper is more reactive than iron
(C) In this reaction Cu^{2+} is oxidized and Iron is reduced
(D) Iron is more reactive than copper

97. Which element has the highest electron affinity in the 3rd period?
(A) Cl
(B) Mg
(C) Si
(D) Na

98. Which among the following has highest catenation ability?
(A) Carbon
(B) Oxygen
(C) Silicon
(D) Hydrogen

99. Which one of the following is an amphoteric oxide?
(A) Zinc oxide
(B) Copper oxide
(C) Sodium oxide
(D) Potassium oxide

100. Acids turn litmus to which colour?
(A) Blue
(B) Orange
(C) Red
(D) Yellowish green

101. Which of the following is NOT a Saturated hydrocarbon?
(A) Ethane
(B) Benzene
(C) Butane
(D) Hexane

102. Which statement is correct about a chemical reaction?
(A) Change in colour
(B) Production of a gas
(C) Evolution of heat and light
(D) All of the above

103. Rock salt is
(A) A salt found between rocks
(B) A powder of rock
(C) Naturally available solid NaCl
(D) Mixture of salt and rock powder

104. How much % of carbon is present in the earth's crust?
(A) 0.01%
(B) 0.02%
(C) 0.03%
(D) 0.04%

105. Copper sulphate is blue in colour due to which one of the following reason?
(A) Presence of moisture
(B) Removal of water of crystallization
(C) Presence of sulphate
(D) None of the above

106. What will be the pH of salt formed when strong acid and weak base are made to react?
(A) Basic
(B) Acidic
(C) Neutral
(D) Any of the above

107. The metal which exists as liquid at room temperature is
(A) Sodium
(B) Mercury
(C) Gallium
(D) Caesium

108. All the following are metallic properties excluding one.
(A) Good malleability
(B) Good ductility
(C) Non conduction of heat
(D) Electrical conduction

109. When calcium metal is put into water, it floats because
(A) It is lighter than water
(B) It gets adsorbed with hydrogen gas
(C) It become powder
(D) None of the above

110. Which statement is correct about isomerism?
(A) Same molecular formula but different structural formula
(B) Same empirical formula but different molecular formula
(C) Same structural formula but different molecular formula
(D) Same molecular formula but different empirical formula

Section 4 - Mathematics

111. Linear equations 2x+3y=7 and (a-b) x+ (a+b) y = -(3a+b-2) have an infinite solutions. Find the value of a and b?
(A) 1,5
(B) 5,1
(C) 5,2
(D) 5,3

112. Amy is standing 9 meters in front of Ethan. Jamie is sitting 12 meters to Ethan's right. How far apart are Amy and Jamie?
(A) 12 m
(B) 14 m
(C) 15 m
(D) 10 m

113. What is $1 + \tan^2 x$?
(A) $\sec^2 x$
(B) cos2x
(C) sin2x
(D) cosec2x

114. There are 30 tickets numbered from 1 to 30 in a box. A ticket is drawn. What is the probability that the ticket drawn is bearing an odd number?
(A) 1
(B) 0.5
(C) 0.6
(D) 0.8

115. Find three factorizations for the monomial $-8mn^2$?
(A) $(-4m)(2n^2)$, $(4m^2n)(2n)$, $(-8)(mn^2)$
(B) $(4mn)(-2n)$, $(-8n)(m^2)$, $(-4m)(-2n^2)$
(C) (-4m),(2n),(3n)
(D) $(-4m)(2n^2)$, $(4mn)(-2n)$, $(-8)(mn^2)$

116. D, E and F are points on sides YZ, XZ and XY respectively of triangle XYZ such that XD bisects angle X, YE bisects angle Y and ZF bisects angle Z. If XY= 10 cm, XZ=16cm and YZ = 8 cm. Find XF, ZE and YD?
(A) 6.66, 6.5, 7
(B) 6.66, 7.11, 3.07
(C) 6 ,4, 5
(D) 4, 5, 6

117. 3 sin x – 4 cos x = 0, then what is value of tan x?
(A) 1.33
(B) 1.5
(C) 2
(D) 2.5

118. Find the remainder, when the polynomials $(2x^4-4x^2-2x+3)$ is divided by (x-4)?
(A) 445
(B) 443
(C) 453
(D) 343

119. If two vertices of an equilateral triangle are (0, 0) and (3, 0), find the third vertex.
(A) 3/2, $3\sqrt{3}/2$ and 3/2, $-3\sqrt{3}/2$
(B) -3/2, $3\sqrt{3}/2$
(C) 3/2, $\sqrt{3}/2$
(D) 3, $-\sqrt{3}$

120. Find nature of root in quadratic equation $x^2- 8x +16=0$?
(A) Real and equal
(B) Unequal
(C) Rational
(D) Irrational

121. A solid metallic circular cone 20 cm height with vertical angle 60^0 is cut into two parts at the middle point of its height by a plane parallel to the base. If the frustum, so obtained be drawn into a wire of diameter 1/16 cm, find the approximate length of the wire in meters?
(A) 7868
(B) 7980
(C) 7964
(D) 7846

122. What is value of sec 60^0?
(A) 3
(B) 1
(C) 2
(D) -2

123. If x and y are the roots of the quadratic equation $ax^2+bx+c = 0$, then find the value of $x^2/y+y^2/x$?
(A) $(3abc-b^3)/a^2c$
(B) 2bc-2a
(C) $3abc/a^2$
(D) $(3abc-b^3)/a$

124. A boat covers 32 km upstream and 36 km downstream in 7 hours. Also it covers 40 km upstream and 48 km downstream in 9 hours. Find the speed of the boat in still water and that of the stream?
(A) 3 kmph,8 kmph
(B) 9 kmph,10 kmph
(C) 10 kmph,2 kmph
(D) 2 kmph,5 kmph

125. The surface area of sphere is 616 sq cm. What is its volume?
(A) 1452.32 cub cm
(B) 1437.33 cub cm
(C) 1523.21 cub cm
(D) 1635.23 cub cm

126. If a and b are the roots of quadratic equation $X^2+DX+E=0$. Find the value of (a/b+2) (b/a+2)?
(A) 2(D-2E)/E+5
(B) $2(D^2-2E)/E+5$
(C) 2(D-2E)/E
(D) (D-2E)/E+5

127. If three times the larger of the two numbers is divided by the smaller one, we get 4 as quotient and 3 as remainder. Also if seven times the smaller number is divided by the larger one, we get 5 as quotient and 1 as remainder. Find the numbers?
(A) 20,18
(B) 25,18
(C) 35,25
(D) 25,20

128. What is the LCM of 363 and 396?
(A) 4356
(B) 435
(C) 453
(D) 234

129. If tan x = 1, then what is the value of (sin x + cos x) / (sec x + cosec x)?
(A) 1
(B) 0.5
(C) 2
(D) 2.5

130. In an acute triangle, the measures of two angles are 50° and 60°. What is the measure of the third angle?
(A) 70°
(B) 60°
(C) 90°
(D) 50°

131. Linear equations x+2y = 5 and 3x+ky+15 = 0 have a unique solution. Find the value of k?
(A) 6
(B) 7
(C) $\sqrt{6}$
(D) 8

132. What is value of cos (-60°)?
(A) 3
(B) 1
(C) 0.5
(D) -2

133. Find the area of the rhombus if its vertices are (3, 0), (4, 5), (-1, 4) and (-2, -1) taken in order.
(A) 28 sq units
(B) 24 sq units
(C) 26 sq units
(D) 20 sq units

134. If P (A) = 3/4, P (B') = 1/3 and P ($A \cap B$) = 1/2, then find P ($A \cup B$)?
(A) 11/13
(B) 11/12
(C) 11/14
(D) 12/13

135. The HCF of the polynomials $f(x) = (x+3)(2x^2-3x+a)$ and $g(x) = (x-2)(3x^2+10x-b)$ is (x+3) (x-2). Find the values of a and b?
(A) -2-3
(B) 2,3
(C) -2,3
(D) 2,-3

136. The angle of elevation of the top of a tower from a point on the ground is 30 degree. After walking 30 m towards the tower, the angle of elevation becomes 60 degree. What is the height of the tower?
(A) 26.50 m
(B) 26 m
(C) 25.98 m
(D) 25 m

137. Radius of the circle is 7 cm. What is area of the sector of this circle if the corresponding angle is 30 degree?
(A) 12.83 sq cm
(B) 10.86 sq cm
(C) 8.12 sq cm
(D) 15.23 sq cm

138. The HCF and LCM of two polynomials p(x) and q(x) are 3(X+1) and $18(X^3+1)(X+2)$ respectively. If p(x) = 6(X+1) (X+2), then find the value of q(x)?
(A) $9(X^3+1)$
(B) 10x(x+1)
(C) (x+1)
(D) (X+1)3

139. What is the inclination of X-axis and every line parallel to X-axis?
(A) 45°
(B) 0°
(C) 60°
(D) 90°

140. What is value of cos (45°) x sin (45°)?
(A) 2
(B) 3
(C) 0.5
(D) 1.5

141. The difference between two numbers is 5 and the difference between their squares is 65. Find the larger number?
(A) 9
(B) 10
(C) 11
(D) 12

142. If 2 + 3i is a root of the equation $x^2+px+q = 0$, where p and q are real, then find the value of (p, q)?
(A) (2,3)
(B) (-2,3)
(C) (4,7)
(D) (-4,13)

143. If two coins are tossed, then what is the probability of the event: at least one tail turns up?
(A) 3/4
(B) 4/3
(C) 1/2
(D) 1

144. What least number must be subtracted from each of the numbers 14, 17, 34 and 42 so that the remainders are proportional?
(A) 0
(B) 1
(C) 2
(D) 7

145. D, E and F are the points on sides BC, CA, and AB respectively of triangle ABC such that AD bisects ∠A, BE bisects ∠B and CF bisects ∠C. If AB = 5 cm, BC= 8 cm and CA = 4 cm, determine AF, CE and BD?
(A) 1.6 cm,2.46 cm,4.4 cm
(B) 2 cm,4 cm, 5 cm
(C) 6.4 cm,5.9 cm,4 cm
(D) 3 cm,5 cm,8 cm

146. The area of two similar triangles ABC and triangle DEF are 72 Sq cm and 144 Sq.cm. If EF = 8 cm, find BC?
(A) 5 cm
(B) 5.6 cm
(C) 6 cm
(D) 5.5 cm

147. YB, ZA are medians of a triangle XYZ right angled at X. Find the value of $4(BY^2+ZA^2)$?
(A) 5 YZ
(B) 6 YZ^2
(C) 5 YZ^2
(D) 3 YZ^2

148. Find the sum of the roots of the equation $x^2 – 15x + 28 = 0$?
(A) 15
(B) -15
(C) 28
(D) -28

149. What is the value of sin (90° - A)?
(A) cos A
(B) cot A
(C) cosec A
(D) tan A

150. What is value of sin (-30°)?
(A) 1
(B) -0.5
(C) 1.5
(D) 2

151. Two linear equations are 35x+23y=209 and 23x+35y=197. Find the value of x and y?
(A) 4,3
(B) 4,2
(C) 4,5
(D) 4,1

152. The triangle has a base of 5 m and height of 6 m. What is the area of triangle?
(A) 25 m
(B) 35 m^2
(C) 15 m
(D) 15 m^2

153. Curved surface area of a cone with base radius 40 cm is 1640 pi sq cm. What is the height of the cone?
(A) 8 cm
(B) 9 cm
(C) 10 cm
(D) 11 cm

154. How many three digits number are there which are divisible by 17?
(A) 53
(B) 45
(C) 23
(D) 48

155. If the volumes of two cubical blocks are in the ratio of 1:9, find the ratio of their surface areas?
(A) 1: 3 $(3)^{1/3}$
(B) 3: 3 $(3)^{1/3}$
(C) 3 $(3)^{1/3}$: 1
(D) 3 $(3)^{1/3}$: 3

156. There are 2 lights, one red and the other green. The red one flashes 3 times every minute and the green one flashes 5 times every 2 minute. If the lights start flashing together, then find the total number of times both will have flashed together in an hour?
(A) 31
(B) 40
(C) 24
(D) 48

157. The cone of height 24 cm has a plane base of surface area 154 sq cm. What is its volume?
(A) 1523 cub cm
(B) 1423 cub cm
(C) 1321cub cm
(D) 1232 cub cm

158. An aeroplane flying horizontally 750 m above the ground is observed at an angle of elevation of 60 degree. If after 5seconds the angle of elevation is observed to be 30 degree, what is the speed of the aero plane in km/hr.
(A) 624
(B) 525
(C) 322
(D) 231

159. If each side of a cube is of length 10 cm, then what is the total surface area of the cube?
(A) 300 sq cm
(B) 250 sq cm
(C) 500 sq cm
(D) 600 sq cm

160. A fast train takes 3 hours less than a slow train for a journey of 600 km. If the speed of the slow train is 10 km per hour less than that of the fast train, find the speeds of the two trains?
(A) 50 km,40 km
(B) 55 km,78 km
(C) 35 km,76 km
(D) 44 km,55 km

161. Find a relation between x and y such that the point (x, y) is equidistant from the points (4, 6) and (5, 3).
(A) $x - 3y = 9$
(B) $x + 3y = 9$
(C) $3y - x = 18$
(D) $3y - x = 9$

162. In triangle ABC, AB=AC angle $\angle B=50°$, then find the value of $\angle C$?
(A) 50°
(B) 70°
(C) 60°
(D) 40°

163. A solid is in the form of a right circular cone mounted on a hemisphere. The radius of the hemisphere is 3.5 cm and the height of the cone is 4 cm. The solid is placed in a cylindrical tub, full of water, in such a way that the whole solid is submerged in water. If the radius of the cylindrical tub is 5 cm and its height is 10.5 cm, find the volume of water approximately in cm^3 left in the cylindrical tub?
(A) 768
(B) 678
(C) 680
(D) 684

164. Which of the following is a true statement?
(A) In 1st quadrant all trigonometric ratios are negative
(B) In 1st quadrant all trigonometric ratios are positive
(C) In 2nd quadrant all trigonometric ratios are positive
(D) In 3rd quadrant all trigonometric ratios are negative

165. If a die is thrown, then what is the probability of getting an odd number?
(A) 1
(B) 1.5
(C) 0.5
(D) 0.2

166. The dimensions of a cuboid in cm are 16 x 14 x 20, then what is its total surface area?
(A) 1236 sq cm
(B) 1648 sq cm
(C) 1535 sq cm
(D) 1436 sq cm

167. Find a quadratic equation with roots 7 and 3?
(A) $x^2 + 7x + 3$
(B) $(x+7)(x+3)$
(C) $(x-7)(x-3)$
(D) $x^2 + 3x + 7$

168. Find the coordinates of the point which divides the line segment joining the points (6, – 5) and (8, 5) in the ratio 3: 5 internally.
(A) –27/4, – 5/2
(B) –27/4, 5/2
(C) 27/4, 5/2
(D) 27/4, –5/4

169. Bobby is about to ride a straight water slide. The length of the water slide itself is 15 meters. The splash pool at the end of the slide is 9 meters away from the base of the tower that leads up to the launching platform. How high is the launching platform?
(A) 12 m
(B) 4 m
(C) 2 m
(D) 10 m

170. If the vertices of a triangle are (1, k), (4, -3), (-9, 7) and its area is 15 sq units, find the value of k?
(A) -3
(B) 5
(C) 2
(D) -4

171. A train covered a certain distance at a uniform speed. If the train would have been 12 km/hr faster, it would have taken 8 hours less than the scheduled time. Find if the train were slower by 12 km/hr, it would have taken 12 hours more than the scheduled time. Find the length of the journey?
(A) 2880 km
(B) 2600 km
(C) 2800 km
(D) 2000 km

172. A ship of height 24 m is sighted from a lighthouse. From the top of the lighthouse the angle depression to the mast and the base of the ship is 30 degree and 45 degree respectively. How far is the ship from the lighthouse?
(A) 65.23 m
(B) 60.12 m
(C) 50.10 m
(D) 56.76 m

173. Find the value of t, if the points (t, 2t) (– 2, 6) and (3, 1) are collinear.
(A) 3/4
(B) 4/3
(C) 3
(D) 4

174. In triangle ACE, B is the midpoint of AC, D is the midpoint of CE and BD = 14 and BD is parallel to AE then, find AE?
(A) 28
(B) 14
(C) 12
(D) 197

175. A boy standing at a distance of 48 m from a building observes the top of the building makes an angle of elevation 30 degree. What is the height of the building?
(A) 27.71 m
(B) 25.1 m
(C) 20.5 m
(D) 25.5 m

176. Three baseball players are playing catch. Hisashi is 8 meters south of Nasir and 6 meters west of Pamela. How far does Nasir need to throw the ball to get it to Pamela?
(A) 9 m
(B) 10 m
(C) 8 m
(D) 6 m

177. A rational number 19/q has a non terminating decimal. Find the denominator?
(A) 200
(B) 210
(C) 950
(D) 190

178. Find the 10th term of Arithmetic progression 4.5, 5.5, 6.5?
(A) 14.5
(B) 11.5
(C) 12.5
(D) 13.5

179. Find the perimeter of an equilateral triangle with side length 9.5 m?
(A) 28.5 m
(B) 22 m
(C) 23 m
(D) 24 m

180. The base radii of two right circular cones of the same height are in the ratio 2: 3. What is the ratio of their volumes?
(A) 4:2
(B) 2:3
(C) 4:9
(D) 3:6-

Space for Rough Work: