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Section 1 - Paper I - General Knowledge and Current Affairs

1) Which country does Stan Wawrinka represent in his professional tennis career?

- A) Russia
- B) USA
- C) France
- D) Switzerland

2) Sopana Sangeetham, an Indian classical music was developed in the temples of which Indian state?

- A) Andhra Pradesh
- B) Kerala
- C) Tamil Nadu
- D) Karnataka

3) In the year 1579 Akbar issued the 'Infallibility Decree or Mehzar'. What is the significance of this decree?

- A) The authority to interpret legal laws
- B) The authority to formulate revenue policies
- C) The authority to interpret religious law
- D) The authority to own all the religious lands

4) When were the Asian Games held in Delhi for the first time?

- A) 1971
- B) 1951
- C) 1982
- D) 1963

5) At the inaugural edition of Khelo India School Games launched in January 2018, which among the following cities was ranked top in the Medals Tally?

- A) Karnataka
- B) Kerala
- C) Punjab
- D) Haryana

6) Which of the following is NOT a public sector bank in India?

- A) Axis Bank
- B) Corporation Bank
- C) Syndicate Bank
- D) Canara Bank

7) ASTRO-H space observation satellite has been launched by which of the following space organizations in the world?

- A) European Space Agency
- B) Japan Aerospace Exploration Agency
- C) Indian Space Research Organization
- D) National Aeronautics and Space Administration

8) India's first underwater rail tunnel is constructed in which of the following states?

- A) Maharashtra
- B) West Bengal
- C) Tamil Nadu
- D) Karnataka

9) The Sanskrit word 'Chaturanga' is the name given to which of the following games?

- A) Football
- B) Ludo
- C) Chess
- D) Cricket

10) During the Slave Dynasty, the term 'Turkan-i-Chihalgani' was associated with

- A) Forty religious mullahs or leaders
- B) Forty physicians of the court
- C) Forty turkish artisans
- D) Forty turkish slaves or nobles

11) Who among the following was made the Naib-i-mamlakat and later the ruler of slave dynasty?

- A) Qutb al-Dīn Qutubuddin Aibak
 - B) Razia Sultan
 - C) Iltutmish
 - D) Ghiyasuddin Balban
-

12) The name of which of the following dance forms means dance battle?

- A) Bhangra
 - B) Paika Nrutya
 - C) Kalbelia dance
 - D) Ramlila
-

13) What is the name of a 10-kg satellite developed by students from Indian Institute of Technology (IIT), Bombay and launched by ISRO?

- A) Pratham
 - B) PISAT
 - C) Pathfinder-9
 - D) SCATSAT-1
-

14) Who among the following rulers ordered the construction of Siri fort and the Palace of thousand pillars?

- A) Tipu Sultan
 - B) Ranjit Singh
 - C) Alauddin Khilji
 - D) Razia Sultan
-

15) Onam, the biggest Hindu festival during which snake boat races are conducted, is celebrated in which state of India?

- A) Assam
 - B) Karnataka
 - C) Tamil Nadu
 - D) Kerala
-

16) Which of the following companies was first to launch 'Tap N Pay' contactless digital payment wallet MomoMoney?

- A) Wipro Technologies
 - B) Tech Mahindra
 - C) Patni Computers
 - D) Cognizant Technology Solution
-

17) Which of the following is NOT an English news channel in India?

- A) Headlines Today
 - B) Times Now
 - C) ABP News
 - D) Republic TV
-

18) A traditional Tibetan New Year celebrated with vigour and gaiety in various parts of India is called

- A) Losar
 - B) Jamshed Navroz
 - C) Poila Baisakh
 - D) Cheti Chand
-

19) The Oscar for Best Picture of 2018 was awarded to which of the following movies?

- A) Darkest Hour
 - B) Phantom Thread
 - C) Get Out
 - D) The Shape of Water
-

20) Huawei unveiled its first chip to enable mobile devices to access 5G internet speeds at the Mobile World Congress in Barcelona. It is called the

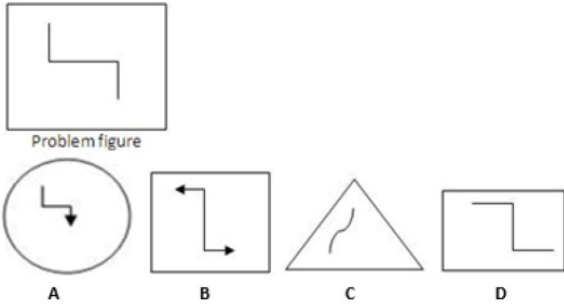
- A) Huawei X51
 - B) Huawei Snapdragon 5G01
 - C) Huawei 5GX1
 - D) Huawei Balong 5G01
-

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Section 2 - Paper I-Reasoning Ability

21) Which among the given options is similar to the problem figure?



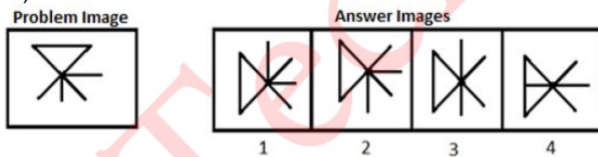
- A) B
- B) C
- C) D
- D) A

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22) Suppose you are standing in the centre box of a 5 X 5 square grid. You can only move along a row or a column only by one step at a time, but NOT along a diagonal. To which of these boxes you can't reach in two steps?

- A) Right most column, third row box
- B) Middle column, top row box
- C) Corner box
- D) Left most column, middle row box

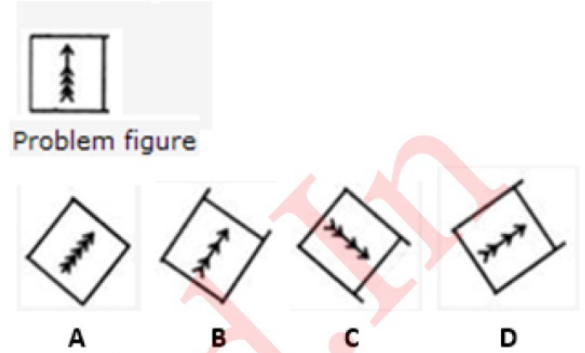
23)



A figure is given on the left, inside a box. On right of it, four images are given. Which of the four images on the right can be formed by rotating the figure by 90 degrees in the anticlockwise direction?

- A) 1
- B) 4
- C) 3
- D) 2

24) Which among the given options is similar to the problem figure based on the number of arrow symbols?



- A) A
- B) B
- C) C
- D) D

25) If A + B means A is the mother of B, A x B means A is the father of B, A \$ B means A is the brother of B and A @ B means A is the sister of B, then which of the following means that P is the son of Q?

- A) Q + R @ P @ N
- B) Q x R \$ P \$ N
- C) Q + R x P @ N
- D) Q x R \$ P @ N

26) Ram is the father of Sushil and Kiran. Sushil is the son of Ram but Kiran is not the son of Ram. How is Kiran related to Ram?

- A) Niece
- B) Son in law
- C) Daughter
- D) Mother

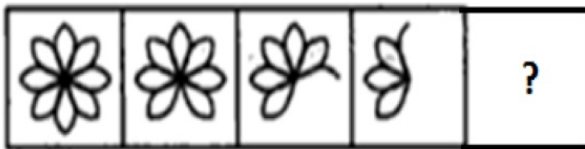
27) What is the next term in the following series?

A1D, G4J, M9P, ____.

- A) R25V
- B) S16V
- C) T4U
- D) S10V

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28) Each of the questions consists of a series of figures followed by four alternative figures. Select a proper figure from the alternatives that will replace the question mark to continue the same series as established by a pattern in the question figure.

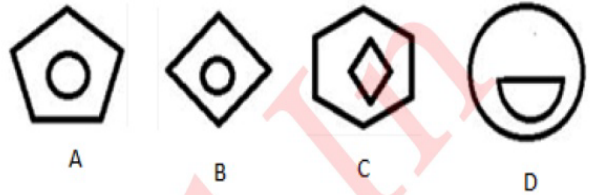


- A)
- B)
- C)
- D)

29) In the problem figure, the shape given inside is related to the outside shape by a certain way. Out of the four options one option is similar to the problem figure. Which is the similar figure?



PROBLEM FIGURE



- A) D
- B) A
- C) B
- D) C

30) If "FREEDOM" is coded as "NPEFFSG" and "CHICKEN" is coded as "OFLDJID", then what is the code word for "DISTRICT"?

- A) DJUSUJTE
- B) UDJSUTJE
- C) UDSJTUEJ
- D) JSUDEUJT

31) R walks northwards. After a while, he turns to his right and a little further to his left. Finally after walking a distance of 1 km, he turns to his left again. In which direction is he moving now?

- A) East
- B) South
- C) North
- D) West

32) A man walks 72 meters east from the point P and then he turns to his right and after walking 30 meters reaches point Q. Find the shortest distance between point P and Q?

- A) 90 meters
- B) 42 meters
- C) 78 meters
- D) 102 meters

33) 'A' started walking towards South. After walking 60 meters he took a right turn and walked 20 meters. He then took a right turn and walked 100 meters. He again took a right turn and walked 20 meters and stopped. How far and in which direction was he from the starting point?

- A) 20 meters east
- B) 10 meters west
- C) 40 meters south
- D) 40 meters north

34) Find the next letter of the series:

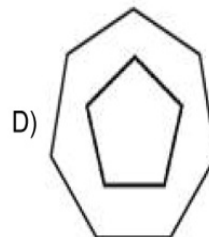
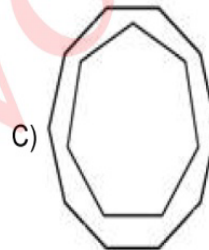
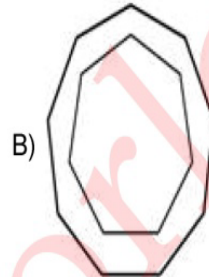
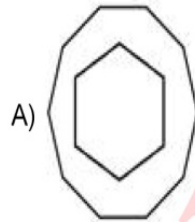
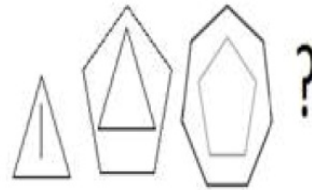
A, H, A, L, U, ?

- A) J
- B) I
- C) H
- D) L

35) Pointing to a girl in the photograph, B said, "Her mother's brother is the only son of my mother's father, who has got only daughter." How is the girl's mother related to B?

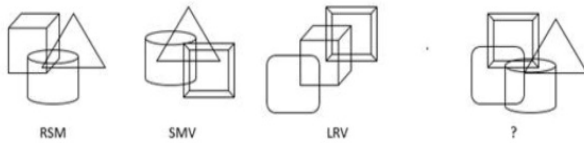
- A) Grandmother
- B) Aunt
- C) Mother
- D) Sister

36) Which figure replaces the question mark in the given problem?



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37) Observe the figures below with their corresponding codes and find the correct code for the last figure.



- A) LSMR
- B) LSMV
- C) LRMV
- D) RSMV

38) In a certain code language if CAMPUS is coded as EDRWFF, then how will be ANSWER coded in the same language?

- A) CQXDNC
- B) CQXDOE
- C) CQXDPE
- D) BRXDPE

39) If CARTRIDGE is written as KMVTVEJGI and PRINTER is written as XVEZTIV, then DESKTOP will be written as

- A) JIUCTYX
- B) JIVCTYZ
- C) JICVTYX
- D) JIVCTYN

40) Kavi is the son of S, T is the father of Shruti. S is the sister of Vijay. If T is married to Kavi's mother. What is the relation of Vijay with Shruti?

- A) Maternal Uncle
- B) Maternal Grandfather
- C) Brother
- D) Grandfather

Section 3 - Paper I-Computer Literacy

41) In Excel, vertical alignment of a cell(s) is changed by choosing which of the following options?

- A) Paragraph dialog box
- B) Page Setup dialog box
- C) Standard toolbar
- D) Formatting toolbar

42) Which of the following programs provides ads continuously through pop-ups, to the users?

- A) Middleware
- B) Ads container
- C) Spyware
- D) Adware

43) In web browsers, Cookie is a

- A) Malicious data
- B) Antivirus software
- C) Operating system
- D) Small program to store the session data

44) In Excel 2016, If you want to insert three columns between columns G and H you would

- A) Select column H and right click and select insert for three times
- B) Select column G and right click and select insert for three times
- C) Select columns D, E, and F and right click and select insert for one time
- D) Select columns E, F and G and right click and select insert for one time

45) In MS Excel 2016, spelling tool is found in which of the following tabs ?

- A) Standard
- B) Review
- C) Formatting
- D) Draw

46) Which of the following authentication systems is a hardware authentication tool?

- A) Biometric Machines
- B) Personal Identification Numbers (PINs)
- C) Username and Password
- D) One Time Passwords

47) In Excel, most of the repetitive tasks can be automated by using

- A) Macros
- B) Charts
- C) Pivot Tables
- D) Sort and Filter

48) In MS Excel 2016, Comments can be added by which of the following menu options?

- A) Review ->New Comment
- B) File -> New Comment
- C) Formulas-> New Comment
- D) View -> New Comment

49) In MS Word, Landscape is

- A) Page Layout
- B) Paper Size
- C) Page Orientation
- D) Page Number

50) In MS Word 2016, modification in mail merge recivers data is done by clicking which of the following buttons?

- A) Data Source button
- B) Edit Recipient List
- C) Data editing button
- D) Edit button

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Section 4 - Paper I- Pedagogy and Educational Management and Policy

51) In order to measure the personality of students, a school adopts the objective methods of personality measurement. Which of the following methods will be most suitable in this regard?

- A) Observation
- B) Story completion test
- C) Rorschach Test
- D) Thematic Apperception Test

52) Community Mobilisation and establishment of the alternative schooling centres is the responsibility of

- A) Village Education Committee
- B) School Construction Committee
- C) Village Construction Committee
- D) School Education Committee

53) A student learns to assemble an electrical circuit in science class by observing the teacher. However, since he has not tested this he doesn't assemble the circuit. However, some days later in his house the fuse goes off and he repairs it. This is which kind of learning?

- A) Latent learning
- B) Incidental learning
- C) Accidental learning
- D) Intentional learning

54) When teaching a topic to students of grade 1, a teacher always tries to combine the verbal information with visual information in the form of diagrams, pictures and illustrations related to the topic. As per Bruner which mode of representation is being followed by this teacher?

- A) Symbolic representation
- B) Multiple representation
- C) Enactive representation
- D) Iconic representation

55) Determining factors of individual differences in human beings are related to

- A) Interaction between heredity and environment
- B) Differences in environment
- C) Differences in heredity
- D) Differences in assimilation and accommodation

56) In a constructivist classroom, the students are engaged in verifying the theory and generalizations presented to them by the teacher. Which method of teaching has the teacher adopted?

- A) Deductive method
- B) Heuristic method
- C) Project method
- D) Problem solving method

57) Which of the following options was a basic feature of Wardha scheme of education formed under the chairmanship of Dr. Zakir Hussain?

- A) External exams were conducted every month
- B) The medium of instruction was English
- C) Inclusion of craft centered education
- D) Inclusion of text book-based education

58) What does UGC stand for?

- A) University Grants Commission
- B) University Governance Commission
- C) Universal Grants Commission
- D) University Governing Council

59) Which of the following is advised by the teacher in whose class there are a few gifted students?

- A) The students will be asked to be in the higher classes
- B) Whenever the students want, they will be taught
- C) The students are treated equally along with the class
- D) Special classes with enriched programmes can be conducted

60) The regulatory powers on Open and Distance Learning system in India is vested with which of the following government bodies?

- A) Indian Education Commission
- B) University Grants Commission
- C) Distance Education Council
- D) University Education Council

61) Effectiveness of teaching is more when there is the use of

- A) Words
- B) Working models
- C) Coloured slides
- D) Projects or excursions

62) Which of the following committees was set up to review National Policy on Education 1986?

- A) Yugandhar Committee
- B) Kothari Commission
- C) Ramamurti Committee Report
- D) Sarkar Committee

63) Setting goals and deciding strategies of teaching occurs in which phase of teaching?

- A) Pre active phase
- B) Exit Phase
- C) Interactive phase
- D) Post active phase

64) A constructivist classroom requires the the science teacher to

- A) Demonstrate the experiment step wise and logically
- B) Plan real life problems based lessons integrated with multimedia
- C) Engage in lot of questioning and reinforce the students when they respond correctly
- D) Act as a facilitator and give students ample opportunity to manipulate hands on material

65) Which of the following resolutions were passed at Wardha Education conference 1937?

- A) English medium in selected schools
- B) Free and Compulsory Education
- C) Develop only social skills
- D) Increase funds to all rural schools

66) The broader meaning of education includes all the experiences and knowledge acquired through

- A) Family and friends in an informal way
- B) Formal, informal and incidental learning
- C) Formal classroom learning
- D) Peer group discussions and sessions

67) Achievability, Communicable and meaningful, realistic and continuity are the characteristics of

- A) Basic Learning Level
- B) Minimum Learning Level
- C) Primary Learning Level
- D) Maximum Learning Level

68) A teacher notices that some students in the class have anxiety and phobia towards certain subject and this is affecting their performance in the class. To remove this phobia which of the following will be most useful?

- A) Classical Conditioning
- B) Operant Conditioning
- C) Thorndike's law of learning
- D) Meaningful Verbal learning

69) Which of the following statements is TRUE to consider Education as a product?

- A) The act of developing the intellect, critical thinking abilities is involved in the process of learning
- B) The learning involves social and cultural understanding, and understanding of one's own self
- C) The learning takes place throughout life which is an active and a dynamic process
- D) The learner acquires knowledge, skills and values as outcomes of learning

70) The teachers who teach Classes 9 and above in Bal Bharti School tell students about careers which students can enter into after they complete their school education. This means that they are providing them

- A) psychological education
- B) social education
- C) vocational education
- D) simple education

71) Which of the following is the right combination for initiation of education ceremony?

- A) Muslim: Pabbajja
- B) Buddhism: Bismillah-Khani
- C) Hindu : Upanayana
- D) Muslim : Upanayana

72) Name the dimension of equality and social justice for which the school system will have to strive for.

- A) Moral difference
- B) Psychological disparity
- C) Social disturbance
- D) Economic disparity

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73) What does the epigenetic principle of development given by Erik Erikson emphasize?

- A) Environment plays crucial role in personality development
- B) Development of personality occurs in a predetermined order
- C) There is conflict between the id and super ego during personality development
- D) Personality development is individualistic in nature

74) A student while playing a game on the mobile phone learns many new vocabulary words. This is an example of which kind of learning?

- A) Intentional learning
- B) Incidental learning
- C) Informal learning
- D) Formal learning

75) The continuance of a child in a single class for two or three years due to failure is referred as

- A) Wastage
- B) Stagnation
- C) Retention
- D) Access

76) The Theory of operant conditioning focuses on the concept of conditioning which is brought about with the help of an operant. This theory was propounded by

- A) Skinner
- B) Pavlov
- C) Thurstone
- D) Thorndike

77) NCF 2005 recommends that total homework time for secondary and higher secondary should be about

- A) 17-18 hours a week
- B) 19-20 hours a week
- C) 10-12 hours a week
- D) 14-16 hours a week

78) Ms Romi the class teacher realized that Richa had a problem in writing properly after meeting with an accident. Richa was probably suffering from a learning disability called

- A) dyslexia
- B) dyscalculia
- C) dyspepsia
- D) dysgraphia

79) Out of twelve years of schooling, eight years are termed 'elementary education', which was made compulsory. To which of the following age group does it correspond?

- A) Between 6-14 years of age
- B) Between 4-18 years of age
- C) Between 7-15 years of age
- D) Between 5-13 years of age

80) The 1986 National Policy on Education was modified in

- A) 1996
- B) 1991
- C) 1992
- D) 1994

81) We would associate the principle of Ananda Yoga with which of the following philosophers?

- A) Vivekananda
- B) Raja Ram Mohan Roy
- C) Gandhi
- D) Tagore

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82) In which of the following methods, to promote active learning, a teacher asks questions to students during the course of teaching?

- A) Socratic method
- B) Lecture method
- C) Scientific method
- D) Playway method

83) Which of the following could be a problem faced by a student who continuously rubs his eyes and pays less attention during blackboard work?

- A) Audio problem
- B) Dental problem
- C) Vision problem
- D) Mental problem

84) In the field of education, which of the following is the CORRECT expanded form of the acronym NIOS?

- A) National Institute of Open Schooling
- B) National Information for Open School
- C) National Industrial Open School
- D) National Institute of Objective Schooling

85) The last stage of development according to Erikson speaks about

- A) Ego-integrity versus despair
- B) Hope versus loss
- C) Intimacy versus isolation
- D) Love versus hate

86) A punching bag is put in a school to be used by students to vent out their emotions and frustrations. This punching bag idea is based on which defence mechanism?

- A) Projection
- B) Repression
- C) Catharsis
- D) Reaction formation

87) When was Bengal Primary Education bill passed?

- A) 1925
- B) 1921
- C) 1919
- D) 1923

88) Dave committee gave the following recommendations for primary education.

- A) Relating environment with education
- B) Indicators and skills for Achievement of Minimum Learning Level
- C) Indicators for woman equality
- D) Minimum attendance levels

89) Which of the following resolutions were passed at Wardha Education conference 1937?

- A) Increase funds to all rural schools
- B) Develop only social skills
- C) English medium in selected schools
- D) Free and Compulsory Education

90) According to Burt (1973), a child who is unable to cope up with the work normally expected of his school mates of his age is called

- A) Stupid
- B) Slow or backward
- C) Slow and Steady
- D) Dumb

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Section 5 - PaperII-Physics

91) A compound microscope consists of an objective lens of focal length 2 cm and eye piece of focal length 6.25 cm separated by distance of 15 cm. How far from the objective should an object be placed in order to obtain the final image at infinity?

- A) 15 cm
- B) 2.59 cm
- C) 16 cm
- D) 6.25 cm

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92) A body delivers constant power when it is moved along a straight line. The distance moved by a body in time t is proportional to

- A) $t^{1/4}$
- B) $t^{3/2}$
- C) t
- D) $t^{13/4}$

93) If the tube length of an astronomical telescope is 110 cm and the magnifying power is 10. What is the focal length of objective?

- A) 11 cm
- B) 100 cm
- C) 10 cm
- D) 110 cm

94) A compound microscope has an objective of focal length 1 cm and an eye piece of focal length 2.5 cm. An object has to be placed at a distance of 1.2 cm away from the objective for normal adjustment. The angular magnification of the compound microscope is

- A) 50
- B) 11
- C) 6
- D) 5

95) What is the "escape" velocity for earth if its mass is 5.98×10^{24} kg, its radius is 6.37×10^6 m and $G = 6.67 \times 10^{-11}$ N-m²/Kg²?

- A) 1.12×10^4 m/s
- B) 3.12×10^8 m/s
- C) 1.12×10^8 m/s
- D) 1.12×10^4 cm/s

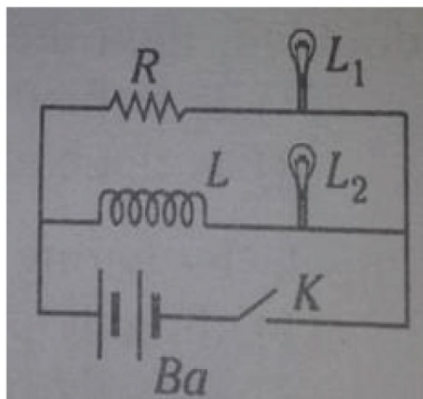
96) A beam of white light is incident from air to glass slab at normal incidence. After travelling through the slab, the first colour to emerge is

- A) violet
- B) blue
- C) green
- D) orange

97) What should be the power of the microscope to view an object with an angular magnification of 10 if the near vision of the average person is 25 cm?

- A) 0.04 D
- B) 10 D
- C) 40 D
- D) 250 D

98) A resistance R is connected in series with a lamp L_1 and an inductance L is connected in series with another lamp L_2 . These combinations are connected across a battery through a press key as shown in the figure. When the key is switched off:



- A) Both L_1 and L_2 stop glowing after some time
- B) Both L_1 and L_2 stop glowing at once
- C) L_1 stops glowing immediately but L_2 with some delay
- D) L_2 stops glowing immediately but L_1 with some delay

99) Identify the following statement to the correct option listed below.

"Every point on a wave-front may be considered a source of secondary spherical wavelets which spread out in the forward direction at the speed of light. The new wave-front is the tangential surface to all of these secondary wavelets." This is in accordance to

- A) Electromagnetic theory
- B) Huygen's principle
- C) Interference principle
- D) Superposition principle

100) The coefficient of self inductance of a coil is 8 mH. If the current through it is changed by 1 mA in 1 second, what is the induced e.m.f?

- A) 7 microvolt
- B) 8 microvolt
- C) 9 microvolt
- D) 6 microvolt

101) If a cell has an emf of 2.5 V and an internal resistance of 1Ω , then the terminal current of the cell with 4Ω resistor connected across its terminals is

- A) 5 A
- B) 0.5 A
- C) 1.5 A
- D) 7.5 A

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102) Lenz's law deals with

- A) magnitude of induced e.m.f.
- B) direction of induced e.m.f.
- C) direction as well as magnitude of induced e.m.f.
- D) phenomenon of induced e.m.f.

103) Beat is the phenomenon which occurs due to

- A) Diffraction of two waves
- B) Reflection of two waves
- C) Interference of two waves
- D) Scattering of two waves

104) If the radius of 10th and 20th Newton's rings are 0.2 cm and 0.3 cm respectively and plano-convex lens is of focal length 90 cm, the wavelength of light is

- A) 400 nm
- B) 1112 nm
- C) 278 nm
- D) 620 nm

105) Which among the following is SI unit of Polarization?

- A) C/m^3
- B) C/m
- C) C/m^2
- D) C/m^4

106) The effective capacitance of two capacitors are $\frac{4}{3}$ μF and $6 \mu\text{F}$ when connected in series and parallel. Compute the capacity of each capacitor (C_1 and C_2)?

- A) $2 \mu\text{F}$ and $4 \mu\text{F}$
- B) $6 \mu\text{F}$ and $4 \mu\text{F}$
- C) $3 \mu\text{F}$ and $5 \mu\text{F}$
- D) $10 \mu\text{F}$ and $9 \mu\text{F}$

107) The electric charge on a hole equals

- A) $3.2 \times 10^{-19} \text{ C}$
- B) 0 C
- C) $1.6 \times 10^{-18} \text{ C}$
- D) $1.6 \times 10^{-19} \text{ C}$

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108) The vibrations which take place in the diaphragm of a microphone are

- A) Forced vibrations
- B) Electrically maintained vibrations
- C) Free vibrations
- D) Damped vibrations

109) A particle of mass 0.5 kg is moving in a circle of radius 0.1 m with a constant speed of 2.0 m/s . Its acceleration at any moment is

- A) 0 m/s^2
- B) 40 m/s^2
- C) 25 m/s^2
- D) 10 m/s^2

110) A wire of resistance 3Ω is drawn out so that its new length is three times its original length, The resistance of the longer wire is

- A) 24Ω
- B) 27Ω
- C) 9Ω
- D) 6Ω



Section 6 - PaperII-Chemistry

111) $\text{CO}_2 + \text{CH}_3\text{MgBr} \longrightarrow \text{X}$. X on hydrolysis produces

- A) $\text{C}_2\text{H}_5\text{OH}$
- B) HCHO
- C) CH_3CHO
- D) CH_3COOH

112) What will be the approximate electronegativity value for bromine considering Allred-Rochow scale? Given: the covalent radius of Br is 1.14.

- A) 2.747
- B) 3.847
- C) 1.289
- D) 1.867

113) If the electronegativities of fluorine and chlorine are 4.0 and 3.0 respectively then the dipole moment of chlorine monofluoride, ClF is (D is the unit of dipole moment)

- A) 3.5 D
- B) 7.0 D
- C) 1.0 D
- D) 4.0 D

114) The conversion of acid chlorides to respective aldehydes is known as

- A) Rosenmund reduction
- B) Clemmensen reduction
- C) Meerwein-Ponndorf Verley reduction
- D) Birch reduction

115) Colloids are usually purified by

- A) solvolysis
- B) peptization
- C) coagulation
- D) dialysis

116) Which among the following rules/principles states that "when a stress is applied to a system in equilibrium, the position of the equilibrium shifts in the direction that will relieve the applied stress"?

- A) De Broglie's Principle
- B) Le Chatelier's Principle
- C) Aufbau Principle
- D) Hund's Rule

117) Isopropyl benzene on reaction with alk.KMnO_4 produces

- A) benzaldehyde
- B) benzoic acid
- C) salicylic acid
- D) cinnamic acid

118) The number of "pi" and "sigma" bonds present in 1-butene-3-yne respectively is

- A) 3 and 5
- B) 5 and 3
- C) 3 and 7
- D) 7 and 4

119) Which among the following is an example of Non-Benzoid Aromatic compound?

- A) Aniline
- B) Cyclopropane
- C) Acetaldehyde
- D) Tropolone

120) What will be the CORRECT order in third ionization energies of group 13 elements of a periodic table?

- A) $\text{B} > \text{Ga} > \text{Tl} > \text{Al} > \text{In}$
- B) $\text{B} > \text{Ga} < \text{Tl} > \text{Al} < \text{In}$
- C) $\text{B} < \text{Ga} > \text{Tl} < \text{Al} > \text{In}$
- D) $\text{B} < \text{Ga} < \text{Tl} < \text{Al} < \text{In}$

121) ΔH for the reaction $N_2 + 3H_2 \rightarrow 2NH_3$ is

- A) $\Delta H = \Delta E - 2RT$
- B) $\Delta H = \Delta E + 3RT$
- C) $\Delta H = \Delta E - RT$
- D) $\Delta H = \Delta E + RT$

122) Which one of the following is a disaccharide?

- A) Cellulose
- B) Lactose
- C) Glucose
- D) Fructose

123) What will be the CORRECT order of the length in the C-F bonds for the different compounds given in the options?

- A) $CH_3F > CH_2F_2 > CHF_3 > CF_4$
- B) $CH_3F > CH_2F_2 > CHF_3 < CF_4$
- C) $CH_3F > CH_2F_2 < CHF_3 > CF_4$
- D) $CH_3F < CH_2F_2 < CHF_3 < CF_4$

124) For the first order reaction the time taken for the completion of 99.9% reaction is 9 hours, then the time taken for the completion of 90% of reaction is

- A) 5 hours
- B) 9 hours
- C) 7 hours
- D) 3 hours

125) The reagent used to identify urea by biuret test is

- A) $FeSO_4$
- B) $AgNO_3$
- C) $FeCl_3$
- D) $CuSO_4$

126) Which of the following options represents the basic property of the auxochrome of a dye?

- A) It acts as a preservative to protect the colour of the dye
- B) It is responsible for giving a pungent smell to the dye
- C) It influences the intensity of the colour of the dye
- D) It is the color producing group or agent of the dye

127) The nature of C-Sn bond in alkyl tin is usually a

- A) ionic bond
- B) covalent bond
- C) hydrogen bond
- D) van der waals attraction

128) $C_{20}H_{42}$ is the molecular formula for which of the following compounds?

- A) Icosane
- B) Decane
- C) Aniline
- D) Triacontane

129) Gelatin is mostly used in making ice cream in order to

- A) prevent making a colloid
- B) stabilize the colloid and prevent crystallization
- C) stabilize mixture
- D) enrich the aroma

130) Phenol on reaction with CO_2 in NaOH produces compound A. A on reaction with B gives aspirin. Then A and B respectively are:

- A) salicylaldehyde and acetic anhydride
- B) salicylaldehyde and acetic acid
- C) salicylic acid and acetic acid
- D) salicylic acid and acetic anhydride

Section 7 - PaperII-Mathematics

131) A system of linear equations in two variables, p and q , is given as $(n + 1)p + (n + 2)q = 8$, $p - (n + 1)q + (n + 2) = 0$, $p + q = 3$. Which of the following would be one of the values of 'n' for which the given system of linear equations is consistent?

- A) 1
B) 0
C) 7
D) 3

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132) Three equal circles of radius 12 cm are placed such that each of them touches other two circles. The approximate area common to circles and triangle obtained by joining their centres is

- A) 150 sq. cm.
B) 226 sq. cm.
C) 176 sq. cm.
D) 190 sq. cm.

133) To create a code for each employee in a Company, 5 letters (A to E) and 10 digits (0 to 9) can be used. A Code consists of 3 letters followed by 3 digits. What is the probability that all the three letters are same in the code?

- A) $1/25$
B) $1/125$
C) $72/12500$
D) $72/2500$

134) The diameter of a circular park is 40 metres. There is a 5 metres wide road surrounding the park. The cost of concreting the road at the rate of Rs. 7/sq.metres is

- A) Rs.9350
B) Rs.4950
C) Rs.2556
D) Rs.3525

135) If the volume of a sphere is divided by its surface area, the result is 27 cm. The radius of the sphere is

- A) 54 cm
B) 12 cm
C) 36 cm
D) 81 cm

136) Let $E \subseteq \mathbb{R}$ and f, g, h are the functions from E into \mathbb{R} . Suppose $a \in E$ and f, g, h are continuous at 'a', then for $h(a) \neq 0$ the quotient f/h is surely

- A) bijection
B) not continuous at a
C) surjection
D) continuous at a

137) If θ_1, θ_2 are the eccentric angles of the extremities of a focal chord of the ellipse $x^2/a^2 + y^2/b^2 = 1$, $a > b$, then for 'e' is the eccentricity of the ellipse, $(e+1)/(e-1) =$

- A) $\tan(\theta_1/2) \tan(\theta_2/2)$
B) $\sin(\theta_1 + \theta_2)/2$
C) $\cos(\theta_1 - \theta_2)/2$
D) $\cot(\theta_1/2) \cot(\theta_2/2)$

138) If α, β, γ are the roots of the equation $x^3 + px^2 + qx + r = 0$ and α, β, γ are non-zero, then $(1/\alpha + 1/\beta + 1/\gamma) =$

- A) pqr
B) $-q/r$
C) $p^2 - 2q$
D) $-p/r$

139) If $z = (y/x) f(x+y)$, then $(y/x)(x+y) f'(x+y) =$

- A) $yz_x + xz_y$
B) $z_x + z_y$
C) $xyz_{(xy)}$
D) $xz_x + yz_y$

140) If $y = \sin(\sin x)$, then $y'' + (\tan x) y' + y \cos^2 x =$

- A) 0
- B) 1
- C) $\tan x$
- D) $\cos^2 x$

141) If $y = \log(\sec x + \tan x)$, then $dy/dx =$

- A) $\tan x$
- B) $\sec x$
- C) $\log|\sec x|$
- D) $\sec x + \tan x$

142) If $Z = e^{ax} \sin by$, where 'a' and 'b' are real constants, then $Z_{xy} =$

- A) $abe^{ax} \cos by$
- B) $be^{ax} \cos by$
- C) $abe^{ax} \sin by$
- D) $ae^{ax} \sin by$

143) In an experiment with 15 observations on 'x' the following results are available $\sum x^2 = 2830$, $\sum x = 170$. One observation that was 20, was found to be wrong and was replaced by correct value 30. What is the correct variance?

- A) 186
- B) 158
- C) 18
- D) 78

144) A triangle is formed by points (5, 8), (2, 7) and the point where lines $x = 3$ and $2x + 3y = 12$ intersect. What will be the coordinates of centroid of this triangle?

- A) (3, 6)
- B) (4, 4)
- C) (11/3, 16/3)
- D) (10/3, 17/3)

145) If for 'A' and 'B' are two parameters $y = A \cos 3x + B \sin 3x$, then

- A) $x dy/dx + y = 0$
- B) $d^2y/dx^2 + 9y = 0$
- C) $d^2y/dx^2 + x^2 y = 0$
- D) $(x^2 - y^2) dy/dx - 2xy = 0$

146) The points (1, -1), (-1/2, 1/2) and (1, 2) are the vertices of

- A) Scalene Triangle
- B) Obtuse Triangle
- C) Isosceles Triangle
- D) Equilateral Triangle

147) Let $E \subseteq \mathbb{R}$, $f: E \rightarrow \mathbb{R}$ and $a \in E$. Suppose there exists a positive real number 'r' such that $(a - r, a + r) \cap E = \{a\}$, then f is

- A) continuous at r
- B) discontinuous at a
- C) continuous at a
- D) discontinuous at r

148) For $a > 0$, $b > 0$, $b \neq 1$, $\lim_{x \rightarrow 0} (a^x - 1)/(b^x - 1) =$

- A) $\log_e a / \log_e b$
- B) $\log_e ab$
- C) $\log_e a$
- D) a/b

149) If the normal to the curve $ay^2 = x^3$ ($a \neq 0$) at a point on it makes equal intercepts with the coordinate axes, then the x-coordinate of the point on the curve is

- A) $4a/9$
- B) $9a$
- C) $-4a/9$
- D) $4a$

150) The equation $x^2 + y^2 = 4$ is solved for all integral values of x and y . These solutions are plotted on coordinate axes. What will be the area of the figure formed by joining these points?

- A) 8 sq. units
- B) 4π sq. units
- C) $4\sqrt{2}$ sq. units..
- D) $8\sqrt{2}$ sq. units

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Answer Key	

1 D	31 D	61 A	91 B	121 A
2 B	32 C	62 C	92 B	122 B
3 C	33 D	63 A	93 B	123 A
4 B	34 C	64 D	94 A	124 D
5 D	35 C	65 B	95 A	125 D
6 A	36 B	66 B	96 D	126 C
7 B	37 B	67 B	97 C	127 B
8 B	38 C	68 A	98 C	128 A
9 C	39 A	69 D	99 B	129 B
10 D	40 A	70 C	100 B	130 D
11 D	41 D	71 C	101 B	131 A
12 B	42 D	72 D	102 B	132 B
13 A	43 D	73 B	103 C	133 A
14 C	44 A	74 B	104 C	134 B
15 D	45 B	75 B	105 C	135 D
16 B	46 A	76 A	106 A	136 D
17 C	47 A	77 C	107 D	137 D
18 A	48 A	78 D	108 A	138 B
19 D	49 C	79 A	109 B	139 D
20 D	50 B	80 C	110 B	140 A
21 C	51 A	81 D	111 D	141 B
22 C	52 A	82 A	112 A	142 A
23 A	53 A	83 C	113 C	143 D
24 A	54 D	84 A	114 A	144 D
25 B	55 A	85 A	115 D	145 B
26 C	56 A	86 C	116 B	146 C
27 B	57 C	87 C	117 B	147 C
28 D	58 A	88 B	118 C	148 A
29 A	59 D	89 D	119 D	149 A
30 B	60 B	90 B	120 A	150 A

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