PREVIOUS YEAR PAPER

# DSSSB Laboratory Assistant (Physics) 2021 — 28 August 2021, Shift 2

DSSSB Other Posts · 28 August 2021 · Shift 2

162 of the paper's 200 questions · +1 for a correct answer, −0.25 for a wrong one · 120 minutes

Left out of the original paper: 38 (any question that needs a figure, a symbol or formatting we cannot show, or whose text did not read back cleanly from the booklet).

Questions from the Delhi Subordinate Services Selection Board's paper of 28 August 2021, Shift 2. Each question is followed by its answer, and the answer key is repeated on the last page.

Take it as a timed practice test: exambharo.com/dsssb-other-posts/previous-year-papers/dsssb-other-posts-2021-laboratory-assistant-physics-28-aug-shift-2/

## General Ability

2. In a certain code, COUSIN is written as UOCSIN. Which one among the options can be a similar word and its code?

(a) LETTER:TELTER
(b) CXEEPT:EXCETP
(c) GROUPS:SPUORG
(d) OTHER:EHTOR

**Answer: (a)**

3. Out of the given options, three are similar in a cer n manner. However, one option is NOT like the other three. Select the option which is different m the rest.

(a) Pony
(b) Cub
(c) Puppy
(d) Foal

**Answer: (a)**

4. Out of the given options, three are similar in a certain manner. However, one option is NOT like the other three. Select the option which is different from the rest.

(a) Lucknow
(b) Tokyo
(c) New Delhi
(d) Islamabad

**Answer: (a)**

5. Select the option that is related to the third term on the same basis as the second term is related to the first term.
Thin wires : Ductile:: Thin sheets: ?

(a) Dense
(b) Shallow
(c) Malleable
(d) Non-Malleable

**Answer: (c)**

6. If Covid-19 is called BNUHC-18 then NURSES may be called ?

(a) OVSTFT
(b) SVOTFT
(c) MTQRDR
(d) QTMRDR

**Answer: (c)**

7. In a certain code, FILM is written as 7101314 and CITY is written as 4102126 then ACTRESS may be written as:

(a) 132051919
(b) 201941818
(c) 242162020
(d) 123502020

**Answer: (c)**

8. Pointing towards Tapu, Kiyansh said his father is the only sibling to my father's child. How is Kiyansh related to Tapu ?

(a) brother
(b) mother’s brother
(c) sister’s son
(d) brother's son

**Answer: (b)**

9. 6 students Chaman, Karman, Harman, Manan, Charan and Karmal participated in a race to win Gold, Silver and Bronze medals by winning the first 3 places respectively.
1. Chaman who finished just behind Karman came last.
2. Harman got a medal by just beating Manan but he lost to Charan.
Which of the following did not win any medal?

(a) Manan
(b) Karman
(c) Charan
(d) Karmal

**Answer: (d)**

10. In the question given below, an assertion is given, followed by a reason. You have to decide whether the assertion is true, reason is true or both are true and if the reason is the correct explanation of the assertion.
Assertion- There are severe landslides and rains in the states of Himachal Pradesh.
Reason- Natural disasters are the big problems to humanity.

(a) Assertion is true, reason is false

(b) Assertion is false, reason is true

(c) Both assertion and reason are true, reason is the correct explanation of the assertion

(d) Both assertion and reason are true, reason is not the correct explanation of the assertion

**Answer: (d)**

11. In the question given below, a statement is given, followed by two arguments I and II. You have to consider the statement to be true even if it seems to be at variance from commonly known facts. You have to decide which of the given argument, if any, follows from the given statement.
Statement- Doctors have to work in the rural areas for 3-4 years for further promotion.
Argument I- Yes, This would help to solve the medical problems of rural areas.
Argument II- No, Doctors would be under emotional stress as many have not lived without their families.

(a) Only argument I is strong

(b) Only argument II is strong

(c) Neither I nor II is strong

(d) Both arguments are strong

**Answer: (a)**

12. Select the option that is related to the third term the same basis as the second term is related to the first term.
15 : 32 :: 18 : ?

(a) 31

(b) 30

(c) 34

(d) 35

**Answer: (d)**

13. Complete the following series:
5 ,7, 25, 131, ___

(a) 921

(b) 131

(c) 925

(d) 224

**Answer: (c)**

15. A football player is running towards the goal which is to the west, then he turns to his right and runs 150 meters and then turns around 180 degrees and starts to run. In which direction is he running now?

(a) East
(b) West
(c) North
(d) South

**Answer: (d)**

16. A man started walking from his house and moved 11 meters to north and then turned to east and walked another 60 meters. How far he is from his starting point?

(a) 69 meters
(b) 49 meters
(c) 41 meters
(d) 61 meters

**Answer: (d)**

## General Awareness

21. Sanctum (garbhagriha literally 'womb-house') , is one of the basic form of:

(a) Hindu Temple
(b) Buddhist Temple
(c) Gurudwara
(d) Synagogue

**Answer: (a)**

22. The popular temple architecture style in northern India:

(a) Garbh
(b) Nagara
(c) Niwas
(d) Aalya

**Answer: (b)**

23. Microeconomics is the study of:

(a) Behaviour of individual economic Agent
(b) Study of markets
(c) Study of economics as a whole
(d) Study of Banks

**Answer: (a)**

24. What is a short run in production function?
    (a) At least one of the production factors is fixed
    (b) All production factors vary
    (c) All Production factors are equal
    (d) Production factor does not matter

    **Answer: (a)**

25. What is the scientific name for table sugar?
    (a) Carbohydrates
    (b) Fructose
    (c) Glucose
    (d) Sucrose

    **Answer: (d)**

26. The process due to which fatty food becomes rancid is called:
    (a) Oxidation
    (b) Reduction
    (c) Dehydration
    (d) Hydration

    **Answer: (a)**

27. What is the name and chemical formula of laughin as?
    (a) Nitrogen dioxide (NO ) 2
    (b) Nitrous oxide (N O) 2
    (c) Nitric oxide (NO)
    (d) Nitrate (NO ) 3

    **Answer: (b)**

28. Port Blair is located in:
    (a) North Andaman Island
    (b) Car Nicobar
    (c) South Andaman Island
    (d) Little Andaman Island

    **Answer: (c)**

29. Indira Point, the southernmost point of India lies in which of the following island?
    (a) Car Nicobar Island
    (b) Little Nicobar Island
    (c) North Andaman Island
    (d) Great Nicobar Island

    **Answer: (d)**

30. The practice of women having several husbands is called:
    (a) Polygyny
    (b) Polyandry
    (c) Exogamy
    (d) Endogamy

    **Answer: (b)**

31. Since the 17th century Pondicherry has been a colony of which country till its independence?
    (a) Great Britain
    (b) Netherlands
    (c) France
    (d) Spain

    **Answer: (c)**

32. Indian 'Home Rule movement' was started by _____.
    (a) Bal Gangadhar Tilak and Annie Besant
    (b) Mahatma Gandhi
    (c) Subhash Chandra Bose
    (d) Sardar Vallabhbhai Patel

    **Answer: (a)**

33. When did the Simon Commission come to India?
    (a) 1917
    (b) 1942
    (c) 1930
    (d) 1928

    **Answer: (d)**

34. 'Bhupen Hazarika' is a famous Indian personality belonging to which of the following fields?
    (a) Writing
    (b) Acting
    (c) Singing
    (d) Politics

    **Answer: (c)**

35. Who among the following were the first recipients of ' Bharat Ratna Award?'
    (a) Dr Rajendra Prasad
    (b) C. Rajagopalachari
    (c) Pt. Jawaharlal Nehru
    (d) Sardar Vallabhbhai Patel

    **Answer: (b)**

36. The term 'Republic' means:
    (a) Head of state is elected
    (b) Head of state is monarch
    (c) Oligarchy
    (d) Ruler
    **Answer: (a)**

37. Which of the following set-up of governance, the Indian Government has?
    (a) Federal
    (b) Unitary
    (c) Quasi-Federal
    (d) Fully Independent
    **Answer: (c)**

38. Indian athlete Priyanka Goswami is participating in 2020 Tokyo Olympics in which sport?
    (a) Hockey
    (b) Cricket
    (c) Wrestling
    (d) Race walking
    **Answer: (d)**

39. Who among the following is the first Indian female swimmer who qualified for 2020 Tokyo Olympics?
    (a) Shikha Tondon
    (b) Maana Patel
    (c) Richa Mishra
    (d) Saloni Dalal
    **Answer: (b)**

40. 'Believe in Sports' campaign has been launched by:
    (a) Sports Authority of India (SAI)
    (b) Fédération Internationale de Football (FIFA)
    (c) International Olympic Committee (IOC)
    (d) International Cricket Council (ICC)
    **Answer: (c)**

## Arithmetic Ability

41. If + means ÷, ÷ means -, - means × and × means +, then 40×18+2÷4-3 is:
    (a) 23
    (b) 64
    (c) 37
    (d) 46
    **Answer: (c)**

42. In an examination a student was asked to find 3/14 of a certain number. By mistake, he found 3/4 of it. His answer was 90 more than the correct answer. Then the number is:

(a) 168
(b) 274
(c) 98
(d) 196

**Answer: (a)**

43. If a shopkeeper gives 20% discount and then 10% discount on a book which has the marked price 200, how much would be the selling price (in Rs) of the book?

(a) 163
(b) 144
(c) 124
(d) 116

**Answer: (b)**

45. The average of marks scored by the students of a class is 75. The average of marks of the girls in the class is 80 and that of boys is 70. What is the percentage of girls in the class?

(a) 60
(b) 40
(c) 50
(d) 45

**Answer: (c)**

46. If 40% of (x-y) = 20% of (x+y) then wh perc of x is y?

(a) 33.33
(b) 37.25
(c) 66.67
(d) 32.54

**Answer: (a)**

47. The cost price of a mobile phone is Rs.1200 and it was sold for Rs.900, find the loss %?

(a) 20%
(b) 30%
(c) 45%
(d) 25%

**Answer: (d)**

48. By selling an article at Rs. 900, a shopkeeper makes a profit of 25%. At what price should he sell the article so as to make a loss of 25%?

(a) Rs 560
(b) Rs 540
(c) Rs 420
(d) Rs 460

**Answer: (b)**

49. In a library, the ratio of number of story books to that of non-story books was 3:4 and total number of story books was 1560. When some more story books were bought, the ratio became 3:2. Find the number of story books bought.

(a) 1560
(b) 1250
(c) 840
(d) 990

**Answer: (a)**

50. The ratio of the present age of father to that of son is 7:2. After 10 years their ages will be in the ratio of 9:4. The present ages of the father is _____ years.

(a) 35
(b) 28
(c) 42
(d) 56

**Answer: (a)**

51. Rohan deposited rupees 20000 for 4 year at a rate of 5% p.a. Find the amount Rohan got in rupees.

(a) 28000
(b) 22400
(c) 24400
(d) 24000

**Answer: (d)**

52. Find the compound interest (in Rs), if Rs [illegible]s invested for 2 years at 10% p.a. compounded half-yearly?

(a) 1050
(b) 1320
(c) 1575
(d) 1150

**Answer: (c)**

53. A man decided to cover a distance of 12 km in 144 minutes. He decided to cover two thirds of the distance at 4 km / hr and the remaining at some different speed. Find the speed after the two third distance has been covered.

(a) 13 km/hr
(b) 10 km/hr
(c) 8km/hr
(d) 12 km/hr

**Answer: (b)**

54. If a person walks at 16 km/hr instead of 10 km/hr, he would have walked 30 km more. The actual distance travelled by him is _____ km.

(a) 80

(b) 60

(c) 50

(d) 100

**Answer: (c)**

55. A can do a bit of work in 10 days, which B alone can do in 12 days. How long both working together can do the work?

(a) 62/11 days

(b) 60/11 days

(c) 72/11 days

(d) 9 days

**Answer: (b)**

56. A and B undertake to do a piece of work for Rs. 480. A can do it in 20 days and B can do it in 40 days. With the help of C, they finish it in 8 days. How much should C be paid for his contribution?

(a) Rs 152

(b) Rs 180

(c) Rs 192

(d) Rs 186

**Answer: (c)**

57. If the ratio of radius two Cylinders A and B are in the ratio of 2:1 and their heights are in the ratio of 2:1 respectively. The ratio of their total surface areas of Cylinder A to B is?

(a) 4 : 1

(b) 1:2

(c) 2:1

(d) 4:3

**Answer: (a)**

## General English

61. The sentence below has been divided into three parts. Select the part of the sentence that has an error. If the sentence has no error, select the option 'No Error'.
Marge told the police/ officers that, “I haven’t seen/ them since last week.”

(a) Marge told the police

(b) officers that, “I haven’t seen

(c) them since last week.”

(d) No Error

**Answer: (b)**

62. The sentence below has been divided into three parts. Select the part of the sentence that has an error. If the sentence has no error, select the option 'No Error'.
Hardly had she walked into the/ room that she saw someone/ jumping out the window.

(a) Hardly had she walked into the

(b) room that she saw someone

(c) jumping out the window.

(d) No Error

**Answer: (b)**

63. Select the word segment that substitutes (replaces) the bracketed word segment correctly and completes the sentence meaningfully. Select the option 'no correction required' if the sentence is correct as given.
(Beside ability, the other essential element) in political success is luck.

(a) Besides ability, the other essential element

(b) Beside ability, another essential element

(c) Besides ability, the other essential elements

(d) No correction required

**Answer: (a)**

64. Select the word segment that substitutes (replaces) the bracketed word segment correctly and completes the sentence meaningfully. Select the option 'no correction required' if the sentence is correct as given.
I wouldn't stand for (that sort of behaviour from him, [illegible]was) you.

(a) this sort of behaviour from him, had I been

(b) that sort of behaviour from him, if I were

(c) this sort of behaviour from him, if I w[illegible]

(d) No correction required

**Answer: (b)**

65. Fill in the blank with the most appropriate choice It is possible to _____ a number of different techniques in her work.

(a) demur

(b) discern

(c) disabuse

(d) desiccate

**Answer: (b)**

66. Fill in the blank with the most appropriate choice
A little more discipline in thought would be appropriate before we _____ the bird colonels and stars.

(a) castigate

(b) censure

(c) coalesce

(d) condone

**Answer: (a)**

67. Some parts of a sentence have been jumbled up, and labelled P, Q, R and S. Select the option that gives the correct sequence in which these parts can be rearranged to form a meaningful and grammatically correct sentence.
I saw myself
P. and agitator and
Q. behind-the-scenes
R. lobbyist on some
S. as an advocate
very minor aspects of it.

(a) SPRQ

(b) SQRP

(c) SPQR

(d) SRQP

**Answer: (a)**

68. The question below consist of a set of labelled sentences. Out of four options given, select the most logical order of the sentences which form a paragraph.
Hawking studied physics at University College, Oxford (B.A., 1962), and Trinity Hall, Cambridge (Ph.D., 1966).
P. In 1971 he suggested the formation, following the big bang, of numerous objects containing as much as one billion tons of mass but occupying only the space of a proton.
Q. He continued to work despite the disease's progressively disabling effects.
R. In the early 1960s Hawking contracted amyotrophic lateral sclerosis, an incurable degenerative neuromuscular disease.
S. Hawking worked primarily in the field of general relativity and particularly on the physics of black holes.
These objects, called mini black holes, are so tiny that their immense mass and gravity require that they be ruled by the laws of relativity, while their minute size requires that the laws of quantum mechanics apply to them also.

(a) RPSQ

(b) RQSP

(c) PSQR

(d) PRSQ

**Answer: (b)**

69. Select the word that is opposite in meaning (ANTONYM) to the word given below reconcile

(a) disperse

(b) cynic

(c) pacify

(d) sophisticated

**Answer: (a)**

70. Select the word that is similar in meaning (SYNONYM) to the word given below proliferate

(a) amenable

(b) susceptible

(c) imperfect

(d) escalate

**Answer: (d)**

71. Four words are given, out of which only one word is spelt correctly. Choose the correctly spelt word.

(a) disilussion

(b) disillusion

(c) disilusion

(d) dissillusion

**Answer: (b)**

72. Four words are given, out of which only three words are spelt correctly. Choose the one spelt incorrectly.

(a) pervasive

(b) phlegmatic

(c) phenomanon

(d) precarious

**Answer: (c)**

73. Select the most appropriate meaning of the give[illegible]diom Get down to brass tacks

(a) To politely ask for someone's full at[illegible]

(b) Knuckle tapping on wood in order to avo[illegible]me bad luck

(c) You frequently see the same people in different places

(d) To become serious about something

**Answer: (d)**

74. Select the most appropriate meaning of the given idiom Finding your feet

(a) An aggressive and bold confrontation

(b) To become more comfortable in whatever you are doing

(c) It seems likely, reasonable, or typical

(d) Deteriorating and headed for complete disaster

**Answer: (b)**

75. Select the most appropriate 'one word ' for the expressions given below Periods of time that are very important in history

(a) Crusade

(b) Epoch

(c) Flotilla

(d) Frivolous

**Answer: (b)**

76. Which of the following is true about Bermuda Triangle?

(a) Costing more than a hundred thousand lives in the sea and the air.

(b) Explained disappearances of planes and ships.

(c) Losing absolute contact with base and outside world.

(d) Finding no wreckage of the vessels which crashed and disappeared into the triangle.

**Answer: (d)**

77. When was the first case of unexplained disasters in the Bermuda Triangle recorded?

(a) 1915

(b) 1954

(c) 1945

(d) 1932

**Answer: (c)**

## Discipline1

101. The solution of the equation $(3xy^2)\,dx + (3x^2y + y^3)\,dy = 0$ is

(a) $3xy^2 \div 6 + y^3 \div 4 + C$

(b) $3x^2y \div 2 + y^3 \div 4 + C$

(c) $3x^2y^2 \div 2 + y4 \div 4 + C$

(d) $3x^2y^2 \div 5 + y4 \div 2 + C$

**Answer: (c)**

102. The unit vector normal to $4x^2 + 2y^2 - 2Z = 1$ at the point (1,-1, 2) is

(a) $(-8\,i - 4\,j - 2k) \div \sqrt{84}$

(b) $(8\,i + 4\,j + 2k) \div \sqrt{84}$

(c) $(8\,i + 4\,j - 2k) \div \sqrt{84}$

(d) $(8\,i - 4\,j - 2k) \div \sqrt{84}$

**Answer: (d)**

103. What is the position vector in the spherical polar coordinate?

(a) $r\,(\sin\Theta\cos\varphi\,i + \sin\Theta\sin\varphi\,j + \cos\Theta\,k)$

(b) $r\,(\sin\Theta\cos\varphi\,i + \cos\Theta\sin\varphi\,j + \cos\Theta\,k)$

(c) $r\,(\sin\Theta\cos\varphi\,i + \sin\Theta\sin\varphi\,j + \sin\Theta\,k)$

(d) $r\,(\cos\Theta\cos\varphi\,i + \sin\Theta\sin\varphi\,j + \cos\Theta\,k)$

**Answer: (a)**

104. If 'p' is the probability of success and 'q' is the probability of failure for 'n' no. of trials, then the mean of the Poisson distribution is

(a) $n^2pq$

(b) $np$

(c) $npq$

(d) $\sqrt{npq}$

**Answer: (b)**

105. What is the acceleration of the body of mass 25 kg if constant force of 75 N applied on it?

(a) 5 $ms^{-2}$

(b) 3 $ms^{-2}$

(c) 1 $ms^{-2}$

(d) 6 $ms^{-2}$

**Answer: (b)**

106. Which among the following have same unit to work?

(a) energy

(b) mass

(c) momentum

(d) torque

**Answer: (a)**

107. Which of the following is the unit of viscosity?

(a) Candela

(b) Pascal

(c) Ns $m^{-2}$

(d) N-kg

**Answer: (c)**

108. Which among the following is not the example of ntral force?

(a) Frictional force

(b) Spring force

(c) Electrostatic force

(d) Gravitational force

**Answer: (a)**

109. When the length of the simple pendulum is increased to 16 times, the time period becomes_____.

(a) triple

(b) double

(c) eight times

(d) four times

**Answer: (d)**

110. In non-inertial frame of reference_____.

(a) laws of motion remains same

(b) laws of motion vary from one frame to another

(c) first law remains same

(d) Second law does not change

**Answer: (b)**

111. If the energy of the photon is $9 \times 10^{-19}$ J, the momentum is

(a) 0 kg $ms^{-1}$

(b) $3 \times 10^{-27}$ kg $ms^{-1}$

(c) $9 \times 10^{-12}$ kg $ms^{-1}$

(d) $2\times 10^{-27}$ kg $ms^{-1}$

**Answer: (b)**

112. What is the correct relation between force and electric field?

(a) F = 2q E

(b) F = q÷E

(c) F = E÷q

(d) F = qE

**Answer: (d)**

113. What is the value of magnetic field inside the solenoid?

(a) μ0 nI

(b) μ0 nI÷2

(c) 3μ0 nI

(d) 5μ0 nI

**Answer: (a)**

114. Which among the following do not possess perm nt dipole moment?

(a) Paramagnetic

(b) ferromagnetic

(c) Diamagnetic

(d) Antiferromagnetic

**Answer: (c)**

115. A coil is placed in magnetic field of 5T and magnetic field lines making an angle 60° with axis of the coil. The area of the cross section is 0.25 $m^2$ and number of turns is 50.The magnetic flux linked with the coil is

(a) 31.25 wb

(b) 62.50 wb

(c) 50.25 wb

(d) 45.50 wb

**Answer: (a)**

116. What is the equivalent resistance if two resistor R = 8 ohm and R = 8 ohm are in parallel?
1 2

(a) 24 ohm

(b) 8 ohm

(c) 4 ohm

(d) 16 ohm

**Answer: (c)**

117. The oscillations will be large in the ballistic galvanometer if the moment of inertia in the coil is _____.

(a) low
(b) high
(c) intermediate
(d) Constant

**Answer: (b)**

118. What is the time required for one complete revolution of the particle executing simple harmonic motion?

(a) T = 2πω
(b) T = ω÷π
(c) T = ω÷2π
(d) T =2π÷ ω

**Answer: (d)**

119. The phase difference between the velocity and displacement of a particle executing SHM is

(a) π
(b) 0
(c) 2π
(d) π÷2

**Answer: (d)**

120. The amplitude of the wave at the antinode is _ _____.

(a) Maximum
(b) Minimum
(c) Infinite
(d) 0

**Answer: (a)**

## Discipline2

121. Which among the following is not the type of wavefront?

(a) spherical wavefront
(b) Cylindrical wavefront
(c) Plane wavefront
(d) Elliptical wavefront

**Answer: (d)**

122. What are the path difference and phase differences for the constructive interference?

(a) Δx = (n+1)λ, φ = 2nπ
(b) Δx = nλ, φ = (2n-1)π
(c) Δx = nλ, φ = 2nπ
(d) Δx = (n-1)λ, φ = (2n+1)π

**Answer: (c)**

123. On what principle is the interferometer based?

(a) Superposition of wave

(b) laws of reflection

(c) Fresnel principle

(d) Huygens's principle

**Answer: (a)**

124. In Fraunhofer diffraction, source is at _____.

(a) Finite distance

(b) Infinite distance

(c) minimum distance

(d) in the middle of finite and infinite distance

**Answer: (b)**

125. Which among the following fringes are not sharp and well defined?

(a) Fraunhofer diffraction

(b) Interference

(c) Fresnel diffraction

(d) Newton' ring

**Answer: (c)**

126. When the value of the function repeats itself afte qual interval of time, then function is_____.

(a) Complex

(b) Constant

(c) Non-periodic

(d) Periodic

**Answer: (d)**

128. Which among the following is not the Dirichlet's condition for the given function in the interval (a,b)?

(a) Single valued

(b) Bounded

(c) finite number of discontinuity

(d) Non-periodic

**Answer: (d)**

129. What is the first order partial derivative of the function, $F(x) = x^2 + y^2 + 4xy$ ?

(a) x +4y and y+4x

(b) 2xy +4y and $2y+4x^2$

(c) 2x +4x and 2y+4y

(d) 2x +4y and 2y+4x

**Answer: (d)**

130. The degree of the closeness in the measurement of a quantity to its true value is known as
(a) Accuracy
(b) Precision
(c) Systematic error
(d) random error
**Answer: (a)**

131. On which conservation law, the first law of thermodynamics based?
(a) Conservation of energy
(b) Conservation of momentum
(c) Conservation of mass
(d) Conservation of charge
**Answer: (a)**

132. Which law of thermodynamics establishes the concept of entropy?
(a) First law
(b) Second law
(c) Third law
(d) Fourth law
**Answer: (b)**

133. Which among the following is an example of an ϵ nsive variable?
(a) Temperature
(b) Entropy
(c) density
(d) refractive index
**Answer: (b)**

134. Which among the following is not the thermodynamic potential?
(a) U
(b) F
(c) G
(d) W
**Answer: (d)**

135. The change in enthalpy is given by this relation:
(a) dH = TdS + VdP
(b) dH = TdS - VdP
(c) dH = SdT + PdV
(d) dH = SdT - PdV
**Answer: (a)**

136. What is the degrees of the freedom of the triatomic molecules due to translational motion?

(a) 6
(b) 5
(c) 3
(d) 4

**Answer: (c)**

137. The average translational kinetic energy of the molecule is

(a) kT÷3
(b) kT
(c) kT÷2
(d) 3kT÷2

**Answer: (d)**

138. The collision between the molecules is

(a) perfectly elastic
(b) Inelastic
(c) can be elastic and inelastic
(d) cannot be perfectly elastic and inelastic

**Answer: (a)**

139. At what temperature and pressure, real gas beha ur deviated as said by Ideal Gas Law?

(a) high temperature and low pressure
(b) high pressure and high temperature
(c) High pressure and low temperature
(d) low temperature and low pressure

**Answer: (c)**

140. What is the full form of CRO?

(a) Copper ray oscilloscope
(b) Copper rod Oscillator
(c) Cathode ray oscilloscope
(d) Cathode rod oscillator

**Answer: (c)**

## Discipline3

141. Which among the following DIP IC protects IC from high temperature and also high performance equipment?

(a) Plastic DIP
(b) Ceramic DIP
(c) Plat pack
(d) CSP

**Answer: (b)**

142. The combination of OR and NOT gate is

(a) NAND gate

(b) AND gate

(c) NOR gate

(d) XOR gate

**Answer: (c)**

143. The 2's compliment of 010011 is

(a) 110110

(b) 101100

(c) 100011

(d) 101101

**Answer: (d)**

144. Which among the following combinational logic circuits is used as parallel to serial converter?

(a) Demultiplexer

(b) Decoder

(c) Multiplexer

(d) Encoder

**Answer: (c)**

145. What is the binary addition of 1100 and 0101?

(a) 10001

(b) 1101

(c) 11001

(d) 10011

**Answer: (a)**

146. The cross coupling of which gates can be done to construct basic SP flip-flop?

(a) AND and NOR gate

(b) NOR gate and NAND gate

(c) AND and OR gate

(d) OR and NAND gate

**Answer: (b)**

147. What is the singular point of the function f(z) = 1 ÷ (z-4)?

(a) 4

(b) 0

(c) -4

(d) 2

**Answer: (a)**

148. If the Fourier transform of f(x) i.e. F[f(x)] = f(s), then F[f(ax)] is equal to

(a) af (s)

(b) f (a÷s)

(c) sf(a)

(d) {f(s÷a)}÷a

**Answer: (d)**

151. Which among the following is the value of Planck's constant?

(a) 1.054 x 10 -34 Js

(b) 6.63 x 10 -32 Js

(c) 6.63 x 10 -34 Js

(d) 1.054 × 10 -39 Js

**Answer: (c)**

152. The material object is said to be idealized blackbody when the object _____.

(a) absorbs all the radiation fall on it

(b) reflect all the radiation fall on it.

(c) reflect and absorb some radiation fall on it

(d) neither absorb nor reflect the radiation fall on it.

**Answer: (a)**

153. In the experiment of photoelectric effect, the ma[illegible]um kinetic energy of the ejected electrons depends on the

(a) Number of electron

(b) Amplitude

(c) Intensity

(d) Frequency

**Answer: (d)**

155. Which among the following crystal is used in Davission-Germer experiment to scatter the monoenergetic electron?

(a) Nickel

(b) Copper

(c) Iron

(d) Zinc

**Answer: (a)**

156. Which among the following is known as the localized wave function?

(a) Eigen function

(b) phase velocity

(c) group velocity

(d) Wave packet

**Answer: (d)**

157. The result of the Double slit experiment with electrons tell us about?

(a) Particle nature only
(b) Charge of the particle
(c) Particle and wave nature
(d) Mass of the particle

**Answer: (c)**

158. When one takes a modulus square of the wavefunction of a quantum particle, the result is

(a) Probability Density
(b) Amplitude
(c) Eigen function
(d) Eigen vector

**Answer: (a)**

159. The wave function of a quantum system having a single particle can be written as the linear combination of its

(a) Operators
(b) Eigen values
(c) Eigen functions
(d) Vectors

**Answer: (c)**

160. In which of the following radioactive decay, ato number reduced by two?

(a) Alpha decay
(b) Beta decay
(c) Gamma decay
(d) Inverse decay

**Answer: (a)**

## Discipline4

161. In which among the following reaction, nucleus of the atom splits into two or more smaller nuclei?

(a) Fusion
(b) Beta decay
(c) Fission
(d) Half life

**Answer: (c)**

162. The region enclosed inside the optical cavity is known as

(a) Optical region
(b) Optical resonator
(c) Optical cell
(d) Optical box

**Answer: (b)**

163. Crystal diode converts AC into DC, it can be used as

(a) Rectifier
(b) Amplifier
(c) Transistor
(d) Oscillator

**Answer: (a)**

164. Which among the following diode do not shows negative resistance?

(a) IMPATT diode
(b) Tunnel diode
(c) Gunn diode
(d) Laser diode

**Answer: (d)**

165. What will be the value of emitter current if the base current is 0.05 mA and β = 100?

(a) 2.55 mA
(b) 3 mA
(c) 4.35 mA
(d) 5.05 mA

**Answer: (d)**

166. An electronic device which increase the power o e signal is called as.

(a) Amplifier
(b) Rectifier
(c) Oscillator
(d) Diode

**Answer: (a)**

167. What will be the power gain (in decibel) of an amplifier which has the voltage gain 10 V/V and current gain 10 A/A?

(a) 50 dB
(b) 20 dB
(c) 45 dB
(d) 10 dB

**Answer: (b)**

168. At mid frequency, the voltage gain in the RC coupled amplifier is

(a) Zero
(b) Varies with frequency
(c) Constant
(d) 1

**Answer: (c)**

169. Which among the following is also known as harmonic oscillator?

(a) RL oscillator

(b) Sinusoidal oscillator

(c) C oscillator

(d) Non-sinusoidal oscillator

**Answer: (b)**

170. Which of the following is not a typical characteristic of an ideal OP-AMP?

(a) Zero output impedance

(b) infinite bandwidth

(c) Zero noise

(d) Zero open-loop gain

**Answer: (d)**

171. What is shunted across the feedback capacitor to reduce the error voltage in practical integrator?

(a) Resistor

(b) Capacitor

(c) Inductor

(d) Oscillator

**Answer: (a)**

172. The conversion speed of the analog to digital co erter lies between

(a) 10 ms - 100ms

(b) 1ms - 100ms

(c) 1µs - 100µs

(d) 0.1 µs - 10µs

**Answer: (c)**

173. An electron of mass m is moving freely inside an infinite potential well with the wall at x = 0 and x = 2a. What is the wave function of the first excited state of the electron?

(a) $\psi = A \sin 2\pi x \div a$

(b) $\psi = A \sin \pi x \div a$

(c) $\psi = A \sin \pi x \div 2a$

(d) $\psi = A \sin 2\pi x \div 4a$

**Answer: (b)**

174. The ground state wave function of the particle of mass m confined in the region x = 0 and x = a of infinite square potential is given by $\psi = A \sin(\pi x \div a)$
What is the value of normalization constant A?

(a) $2 \div \sqrt{a}$

(b) $4 \div \sqrt{a}$

(c) $a \div 2$

(d) $(\sqrt{2} \div a)$

**Answer: (d)**

175. Time independent Schrodinger equation is used when the Hamiltonian is independent of

(a) Time explicitly

(b) Time implicitly

(c) Wave function

(d) Energy

**Answer: (a)**

176. The energy eigen values of the time-independent Schrodinger equation for the bound state of a system are

(a) Continuous or discrete

(b) not defined

(c) continuous

(d) discrete

**Answer: (d)**

178. The splitting of the spectral lines in the stark effect is due to

(a) weak Magnetic field

(b) Electric field

(c) Strong magnetic field

(d) Both electric and magnetic field

**Answer: (b)**

179. The splitting of the spectral lines in the presence of weak magnetic field is known as

(a) Zeeman effect

(b) Paschen effect

(c) Seebeck effect

(d) Stark effect

**Answer: (a)**

180. In many-electron atoms, the energy of an orbital electron depends upon the

(a) n only

(b) l only

(c) Both n and l

(d) Neither n nor l

**Answer: (c)**

## Discipline5

181. What is the packing fraction of body centred cell (bcc) lattice?

(a) 68%

(b) 52.40%

(c) 72%

(d) 58%

**Answer: (a)**

182. Which among the following have same atomic factor?

(a) FCC and HCP
(b) BCC and SC
(c) HCP and BCC
(d) SC and FCC

**Answer: (a)**

183. The structure of the crystalline solid is

(a) irregular
(b) linear
(c) regular
(d) circular

**Answer: (c)**

184. Which among the following can be magnetised permanently?

(a) Diamagnetic
(b) ferromagnetic
(c) Antiferromagnetic
(d) Paramagnetic

**Answer: (b)**

185. Which among the following acts as an insulator?

(a) Passive dielectric
(b) active dielectric
(c) superconductors
(d) polarised particle

**Answer: (a)**

186. The temperature above which ferroelectric material changes into dielectrics is called as _____.

(a) Neel temperature
(b) curie temperature
(c) curie-Weiss temperature
(d) Non-critical temperature

**Answer: (b)**

187. The energy gap between the conduction band and valence band is very large in_____.

(a) Semiconductors
(b) conductors
(c) insulators
(d) superconductors

**Answer: (c)**

188. Which one is not the property of the superconductor?

(a) Zero resistivity

(b) perfect diamagnetic

(c) crystal structure and thermal expansion remains constant

(d) entropy and specific heat increases at transition temperature.

**Answer: (d)**

189. Gauss's law in magnetostatics is _____.

(a) div B =0

(b) div B = μJ

(c) div B = A

(d) Div B = σϵ

**Answer: (a)**

190. The plane wave is the simple solution of the Maxwell's equation for the time varying field in

(a) bounded and homogenous medium

(b) unbound and homogenous medium

(c) unbound and non-homogenous medium

(d) bounded and heterogenous medium

**Answer: (b)**

191. What is the value of reflection coefficient in the B wster angle?

(a) 0

(b) 1

(c) infinity

(d) -1

**Answer: (a)**

192. When the electric field components in x and y direction are same, then it is the form of

(a) elliptical polarisation

(b) linear polarisation

(c) circular polarisation

(d) parallel polarisation

**Answer: (c)**

193. The most preferred TE mode in the rectangular wave guide is

(a) TE 10

(b) TE 01

(c) TE 11

(d) TE 20

**Answer: (a)**

194. Which among the following is not the mode of the waveguide?

(a) TM
(b) TE
(c) TEM
(d) SEM

**Answer: (d)**

195. In classical statistics, all the particles are

(a) Distinguishable
(b) Indistinguishable
(c) Both distinguishable and indistinguishable
(d) Neither distinguishable nor indistinguishable

**Answer: (a)**

196. On increasing the temperature of an object, the peak wavelength of the black body spectrum

(a) Increases
(b) Decreases
(c) becomes Zero
(d) becomes constant

**Answer: (b)**

197. Which of the property does not possess by Photo

(a) Rest mass
(b) Momentum
(c) Energy
(d) Frequency

**Answer: (a)**

198. Which among the following principle is not followed by Bose-Einstein Statistics?

(a) Aufbau principle
(b) Pauli's exclusion principle
(c) Hund's rule
(d) Heisenberg's Uncertainty Principle

**Answer: (b)**

199. The spin of the bosonic particles is

(a) Integral
(b) Half integral
(c) both integral and half integral
(d) -1

**Answer: (a)**

200. _____is not example of Fermion.

(a) Photon

(b) Electron

(c) Neutron

(d) Proton

**Answer: (a)**

# Answer key

Answer key from the Delhi Subordinate Services Selection Board's official answer key for this sitting. "—" means the key gave none.

## General Ability

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | **(a)** | 3 | **(a)** | 4 | **(a)** | 5 | **(c)** | 6 | **(c)** | 7 | **(c)** |
| 8 | **(b)** | 9 | **(d)** | 10 | **(d)** | 11 | **(a)** | 12 | **(d)** | 13 | **(c)** |
| 15 | **(d)** | 16 | **(d)** | | | | | | | | |

## General Awareness

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | **(a)** | 22 | **(b)** | 23 | **(a)** | 24 | **(a)** | 25 | **(d)** | 26 | **(a)** |
| 27 | **(b)** | 28 | **(c)** | 29 | **(d)** | 30 | **(b)** | 31 | **(c)** | 32 | **(a)** |
| 33 | **(d)** | 34 | **(c)** | 35 | **(b)** | 36 | **(a)** | 37 | **(c)** | 38 | **(d)** |
| 39 | **(b)** | 40 | **(c)** | | | | | | | | |

## Arithmetic Ability

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | **(c)** | 42 | **(a)** | 43 | **(b)** | 45 | **(c)** | 46 | **(a)** | 47 | **(d)** |
| 48 | **(b)** | 49 | **(a)** | 50 | **(a)** | 51 | **(d)** | 52 | **(c)** | 53 | **(b)** |
| 54 | **(c)** | 55 | **(b)** | 56 | **(c)** | 57 | **(a)** | | | | |

## General English

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | **(b)** | 62 | **(b)** | 63 | **(a)** | 64 | **(b)** | 65 | **(b)** | 66 | **(a)** |
| 67 | **(a)** | 68 | **(b)** | 69 | **(a)** | 70 | **(d)** | 71 | **(b)** | 72 | **(c)** |
| 73 | **(d)** | 74 | **(b)** | 75 | **(b)** | 76 | **(d)** | 77 | **(c)** | | |

## Discipline1

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | **(c)** | 102 | **(d)** | 103 | **(a)** | 104 | [illegible] | 05 | **(b)** | 106 | **(a)** |
| 107 | **(c)** | 108 | **(a)** | 109 | **(d)** | 110 | **(b)** | 111 | **(b)** | 112 | **(d)** |
| 113 | **(a)** | 114 | **(c)** | 115 | **(a)** | 116 | **(c)** | 117 | **(b)** | 118 | **(d)** |
| 119 | **(d)** | 120 | **(a)** | | | | | | | | |

## Discipline2

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 121 | **(d)** | 122 | **(c)** | 123 | **(a)** | 124 | **(b)** | 125 | **(c)** | 126 | **(d)** |
| 128 | **(d)** | 129 | **(d)** | 130 | **(a)** | 131 | **(a)** | 132 | **(b)** | 133 | **(b)** |
| 134 | **(d)** | 135 | **(a)** | 136 | **(c)** | 137 | **(d)** | 138 | **(a)** | 139 | **(c)** |
| 140 | **(c)** | | | | | | | | | | |

## Discipline3

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 141 | **(b)** | 142 | **(c)** | 143 | **(d)** | 144 | **(c)** | 145 | **(a)** | 146 | **(b)** |
| 147 | **(a)** | 148 | **(d)** | 151 | **(c)** | 152 | **(a)** | 153 | **(d)** | 155 | **(a)** |
| 156 | **(d)** | 157 | **(c)** | 158 | **(a)** | 159 | **(c)** | 160 | **(a)** | | |

## Discipline4

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 161 | **(c)** | 162 | **(b)** | 163 | **(a)** | 164 | **(d)** | 165 | **(d)** | 166 | **(a)** |
| 167 | **(b)** | 168 | **(c)** | 169 | **(b)** | 170 | **(d)** | 171 | **(a)** | 172 | **(c)** |
| 173 | **(b)** | 174 | **(d)** | 175 | **(a)** | 176 | **(d)** | 178 | **(b)** | 179 | **(a)** |
| 180 | **(c)** | | | | | | | | | | |

## Discipline5

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 181 | **(a)** | 182 | **(a)** | 183 | **(c)** | 184 | **(b)** | 185 | **(a)** |
| 186 | **(b)** | 187 | **(c)** | 188 | **(d)** | 189 | **(a)** | 190 | **(b)** |
| 191 | **(a)** | 192 | **(c)** | 193 | **(a)** | 194 | **(d)** | 195 | **(a)** |
| 196 | **(b)** | 197 | **(a)** | 198 | **(b)** | 199 | **(a)** | 200 | **(a)** |