Entrance Test for Enrollment in Ph.D. Programme
July 2017

Time: 120 Mins. **Max. Marks: 120**

Stream : **Engineering** Discipline : **Mechanical Engineering** Set : **A** Test ID : 41

Name :

Father's Name :

Roll Number : | | | | | | | | | | *Date :* | | | | | | | | |

Roll Number in words :

Signature of Candidate :

Signature of Invigilator :

IMPORTANT INSTRUCTIONS

- Do not Open seal before start of Exam.
- Fill all the information in various columns in capital letters, with blue/black ball point pen.
- Use of calculators is not allowed.
- All questions are compulsory. No negative marking for wrong answers.
- Each question has only right answer.
- Questions attempted with two or more options/answers will not be evaluated.
- Kindly bring any one of the original photo-identity proofs at the time of entrance test, like Voter ID Card, Driving License, PAN Card or Passport along with **ADMIT CARD.**
- Study the instructions carefully before the start of examination.
- The time duration for the test will be 120 minutes.
- You must report at examination centre 30 minutes prior to examination.
- Test will comprise of two sections. The Section-I will comprise of Research Methodology and section-II will be Subject specific. Each Section will comprise of 60 questions carrying each making total paper of 120 marks.
- **It will be compulsory for the candidate to secure minimum passing marks in each section (which amounts to be 50% i.e. 30 marks for the general category and 45% i.e. 27 for reserved categories in each section)**. The passing marks will be 50% of the total i.e. 60 marks for general category and 45% for reserved categories i.e. 54 marks.
- The questions paper will comprise of Multiple Choice Questions.
- Each question will have only one right answer.
- Blank, Cutting, Erasing, Half filling or Question attempted with two or more answers will not be evaluated
- There is no negative marking for wrong answers.
- OMR sheet should not be folded or crushed.
- Use only **BLACK BALL POINT PEN** to fill the ovals.
- Use of pencil is strictly prohibited.
- Ovals on **OMR sheet** should be darkened completely and properly filled.
- Cutting and erasing on **OMR sheet** is not allowed.
- Do not use any stray marks on the **OMR sheet**.
- Do not use marker or white fluid to hide the marks.
- Fill **ROLL NUMBER** and **TEST ID** carefully on the **OMR sheet.**
- Use of calculator is not allowed.
- Log tables may be provided for calculation work, if required.
- The medium of the examination is English only.
- No sheet will be provided for the rough work. Reverse side of the question paper can only be used for rough work.
- **Carrying mobile phones, electronic gadgets, notes or extra papers in examination hall is not allowed.**

Research Methodology

Section -I

1. Which of the following is the best way to test a hypothesis according to the hypothetico-deductive method?
    a. By finding evidence which supports the hypothesis.
    b. By repeating a study looking for consistency in outcomes.
    c. By rejecting the hypothesis.
    d. By looking for instances where the hypothesis fails.
2. Which of the following are the most similar?
    a. Ordinal, interval and ratio data
    b. Nominal, ratio, and interval data
    c. Nominal and ratio data
    d. Nominal, ordinal and ratio data
3. What sort of variable is dress size?
    a. Ordinal
    b. Ratio
    c. Nominal
    d. Dependent
4. What is deemed a good measure of the quality of a journal?
    a. The intake factor.
    b. The impact factor.
    c. The OPAC factor.
    d. The influence factor.
5. Variables in a cross-sectional design are:
    a. nominal data.
    b. a mixture of both score and nominal data.
    c. frequencies.
    d. score data
6. Studies which measure the same variables in the same cases over time are called:
    a. lagged.
    b. panel.
    c. cross-lagged.
    d. synchronous.
7. Response rate refers to:
    a. how confident you want to be about your results.
    b. how variable participants' responses are.
    c. the proportion of people who take part in a study.
    d. how big a population is.
8. The difference between the mean of a researcher's sample and the mean of the population of the sample is known as the:
    a. sampling error.
    b. significance level.
    c. confidence interval.
    d. standard deviation.
9. The purpose of research is:
    a. to extend the conceptual understanding of a topic.

b. that the empirical work should be testing a theory.
c. primarily to get more data.
d. to produce work of publishable quality.

10. Which of the following is the first step in starting the research process?
    a. Searching sources of information to locate problem.
    b. Survey of related literature
    c. Identification of problem
    d. Searching for solutions to the problem
11. Questionnaire is a
    a. Research method
    b. Measurement technique
    c. Tool for data collection
    d. Data analysis technique
12. Which of the following is not covered under Intellectual Property Rights ?
    a. Copyrights
    b. Patents
    c. Trade Marks
    d. Thesaurus
13. Field study is related to
    a. real life situations
    b. experimental situations
    c. laboratory situations
    d. none of the above
14. Which of the following is a non-probability sample ?
    a. Quota sample
    b. Simple random sample
    c. Purposive sample
    d. (a) and (c) both
15. Formulation of hypothesis may not be necessary in
    a. survey studies
    b. fact finding (historical) studies
    c. normative studies
    d. experimental studies
16. All are causes of non sampling errors except
    a. faulty tools of measurement
    b. inadequate sample
    c. non response
    d. defect in data collection
17. The review of the related study is important while undertaking a research because
    a. it avoids repetition or duplication
    b. it helps in understanding the gaps
    c. it helps the researcher not to draw illogical conclusions
    d. all of above
18. Of all of the steps in the research process, the one that typically takes the most time is
    a. selecting a research method.
    b. developing a hypothesis.
    c. data collection.
    d. formulating the problem.

19. A mean, median and mode are all examples of _____
    a. measures of correlation
    b. measures of enumeration
    c. measures of coefficients
    d. measures of central tendency
20. Research carried out to portray accurately the characteristics of a particular individual, situation or a group are termed as
    a. Exploratory
    b. Descriptive
    c. Diagnostic
    d. None of these
21. A _____ is conducted to detect weaknesses in research instrument's design
    a. Pilot study
    b. Questionnaire
    c. Interview
    d. Sampling
22. One of the important characteristics of a good research is that the purpose of the research is
    a. Clearly defined
    b. Vaguely defined
    c. Not defined
    d. All of the above
23. In order to deliver a good research, a researcher should confine the conclusions to those justified by
    a. The Data
    b. The Perception of Researcher
    c. The Intuition
    d. The Guide
24. The research plan should include
    a. Research objective
    b. Research Methods
    c. Sampling Plan
    d. All of these
25. Which of the following are excellent sources for research topics?
    a. Theory
    b. Personal experience
    c. Replication of prior research
    d. All of the above
26. A review of the literature should enable an investigator to do which of the following?
    a. Ascertain what is already known about a topic.
    b. Identify methodological strategies for designing the study.
    c. Provide the insight necessary to develop a logical framework into which the topic fits.
    d. All of the above.
27. The Internet has become an accepted source of information for educational research. Which of the following is NOT an indicator of the quality of information found on the Internet?
    a. The number of "hits" for the site
    b. The honesty with which information is reported and presented
    c. The authenticity of the information
    d. The lack of bias
28. A literature review should be characterized by all of the following EXCEPT

a. summarize and report each article.
b. use important topics as the organizing structure of the review.
c. analyze all articles for similarities and differences related to major topics.
d. discuss implications relative to the research problem.

29. Which of the following is the BEST hypothesis?
    a. Students taking formative quizzes will perform better on chapter exams than students not taking these quizzes.
    b. Taller students will have higher test scores than shorter students.
    c. Students taught in a cooperative group setting should do better than students in a traditional class.
    d. Students using laptops will do well.
30. Which of the following statistics is most closely related to the standard error of the mean?
    a. Mean
    b. Standard deviation
    c. Z score
    d. Correlation
31. A significant result of a chi square test of significance would suggest the researcher should
    a. accept the null hypothesis.
    b. reject the null hypothesis.
    c. reject the alternative hypothesis.
    d. replicate the study.
32. Ram has set a very conservative alpha level of .001 for his analysis. He is likely concerned about a
    a. Type I error.
    b. Type II error.
    c. standard error.
    d. test of significance.
33. Mr. Sham has identified two groups of students to participate in his study examining the effectiveness of using algebra tiles. One group will use these manipulatives while a second group will receive a traditional lecture approach. Which test should be used to test the differences between the mean scores for the two classes?
    a. t test for dependent samples
    b. t test for independent samples
    c. Chi square
    d. Scheffé post hoc comparison
34. Which of the following is a common post hoc test?
    a. Scheffé
    b. Tukey HSD
    c. Duncan's Multiple Range Test
    d. All of the above
35. Ms. Rani is making decisions to accept students into her college based on a prediction of a student's future performance derived from his or her high school GPA, ACT score, and college placement test score. Which statistical procedure did she use to develop this predictive process?
    a. ANOVA
    b. ANCOVA
    c. Multiple regression
    d. Chi square
36. Which section of a research report sets the stage for the report and indicates where in the report each component, tables, and figures can be found?
    a. Preliminary pages

b. Table of contents
c. Main body
d. Appendices

37. In which section is the researcher allowed greater flexibility to express opinions, discuss implications for educational practice, and suggest additional research?
    a. Review of the literature
    b. Significance of the study
    c. Results
    d. Discussion
38. An unhypothesized result represents a(n)
    a. accepted null hypothesis.
    b. rejected null hypothesis.
    c. unintended result that appeared in the study.
    d. statistical error.
39. The purpose of random sampling is to ensure
    a. a sufficient sample size.
    b. a clearly defined target population.
    c. representativeness of the sample.
    d. representation of specific subgroups in the population.
40. Which of the following is NOT a random sampling technique?
    a. Purposive sampling
    b. Stratified sampling
    c. Cluster sampling
    d. Systematic sampling
41. The logic of purposive sampling is
    a. that a random sample can generalize to a population.
    b. that a few information-rich participants studied in depth yield many insights about a topic.
    c. to include all participants, even though they are not all relevant to the problem.
    d. to use participants because the researcher has access to them.
42. Which of the following is a characteristic of a standardized test?
    a. The administration of the test is controlled carefully to ensure that all examinees experience the same conditions.
    b. The test is developed by experts to ensure it is technically sound.
    c. The scores are interpreted in standard ways.
    d. All of the above.
43. Which of the following is a characteristic of qualitative research?
    a. It relies on disciplined inquiry.
    b. It uses random sampling techniques.
    c. It uses a static, fixed research design.
    d. It is deductive in orientation
44. Memo writing helps accomplish all of the following EXCEPT
    a. identify topics or issues for further exploration.
    b. select appropriate participants.
    c. identify areas that could provide focus for the formal data analysis.
    d. provide opportunities to reflect on methodology.
45. Which of the following represents excellent advice for conducting an interview?
    a. Listen more and talk less.
    b. Don't interrupt.

c. Don't be judgmental about the interviewee's beliefs or views.
d. All of the above.

46. Which of the following types of items is likely to result in the most objective score?
    a. Open-ended
    b. Short answer
    c. Multiple choice
    d. Essay
47. Measures of variability indicate
    a. the average score.
    b. the central tendency of scores.
    c. the extent to which scores differ from one another.
    d. the relationships between variables.
48. Approximately what percentage of scores in a normal distribution fall between +1 and -1 standard deviations?
    a. 50
    b. 68
    c. 75
    d. 99
49. Mr. Ram has ranked the students in his class on the basis of their math scores. He wants to compare these ranks with the ranks of the same students in Ms.Rani's English class. Which correlation coefficient is appropriate for Mr. Ram to use?
    a. Pearson r
    b. Spearman rho
    c. Mean
    d. Quartile deviation
50. Primary data which is gathered by observing relevant actions and people is called
    a. experimental research
    b. ethnographic research
    c. observational research
    d. survey research
51. Idea generation by two or more people thinking as freely as possible is formally known as:
    a. brainstorming.
    b. the learning curve.
    c. forced relationships.
    d. clap-trapping.
52. Which ONE of these is an example of processed data?
    a. Number of visitors to a store.
    b. Tables from surveys.
    c. Customer comments.
    d. CCTV recordings of shopper visits.
53. Which ONE is an advantage of secondary data?
    a. May be outdated.
    b. May not be accurate.
    c. Expensive.
    d. Already exist.
54. With efficient IPR system, India becomes prosperous in terms of "Knowledge Economy", which is a boon towards the goal of VISION-____?
    a. 2020

b. 2030
c. 2040
d. 2050

55. The copyrights does not include rights in form of
    a. news-paper items,
    b. land ownership
    c. story books,
    d. poetry books,
56. In India, Patent rights are governed by
    a. Patent Act, 1970
    b. Patent Act, 1980
    c. Patent Act, 1990
    d. Patent Act, 1950
57. A mark shall not be registered as a trade mark if
    a. It is of such nature as to deceive the public or cause confusion:
    b. It contains or comprises of any matter likely to hurt the religious susceptibilities of any class or section of the citizens of India;
    c. It comprises or contains scandalous or obscene matter
    d. All of these
58. Computer programmes are protected under the
    a. Copyright Act
    b. Trademark Act
    c. Patent Act
    d. All of these
59. The general rule is that copyright lasts for
    a. 45 Years
    b. 50 Years
    c. 55 Years
    d. 60 Years
60. The existing legislation on industrial designs in India is contained in the New
    a. Designs Act, 2000
    b. Designs Act, 2009
    c. Designs Act, 1995
    d. Designs Act, 2015

Section-II

Mechanical Engineering

61. In metal cutting operations, the shear angle is the angle made by the shear plane with the

(a) Direction of the tool axis

(b) Direction of tool travel

(c) Perpendicular to the direction of the tool axis

(d) Central plane of the workpiece

62. A wall of 0.5 m thickness is to be constructed from a material having average thermal conductivity of 1.4 W/mK. The wall is to be insulated with a material having an average thermal conductivity of 0.35 W/mK so that heat loss/m^2 will not exceed 1250 W. If inner and outer temperatures are 1200° C and 15° C respectively, the thickness of insulation required is

(a) 12 cm (b) 15 cm (c) 18 cm (d) 20 cm

63. If the resultant of two forces P and Q acting at an angle θ, makes an angle α with the force P, then

(a) $\tan \alpha = (P \sin \theta) / (P + Q \cos \theta)$ (b) $\tan \alpha = (P \cos \theta) / (P + Q \cos \theta)$

(c) $\tan \alpha = (Q \sin \theta) / (P + Q \cos \theta)$ (d) $\tan \alpha = (Q \cos \theta) / (P + Q \sin \theta)$

64. According to the law of moments, if a number of coplanar force acting on a particle are in equilibrium, then

(a) their algebraic sum is zero

(b) the algebraic sum of their moments about any point in their plane is zero

(c) their lines of action are at equal distances

(d) the algebraic sum of their moments about any point is equal to the moment of their resultant force about the same point

65. With which of the following can the diameter of a finish turned shaft be best checked?

(a) Dial indicator (b) Slip gauge

(c) Height gauge (d) Micrometer screw gauge

66. Two insulating materials of different thermal conductivities are available for lining a pipe carrying a hot fluid. If radial thickness of each material is the same, then

(a) Material with higher thermal conductivity should be used for the inner layer and one with lower thermal conductivity for the outer.

(b) Material with lower thermal conductivity should be used for the inner layer and one with higher thermal conductivity for the outer.

(c) It is immaterial in which sequence the insulating materials are used.

(d) It is not possible to judge unless numerical values of dimensions are given.

67 Which of the following are measured by a 'sine bar'?

(a) Gear profiles (b) External tapers

(c) Internal tapers (d) Surface roughness

68 Which one of the following types of compressors is mostly used for supercharging of I.C. engines?

(a) Radial flow compressor

(b) Axial flow compressor

(c) Roots blower

(d) Reciprocating compressor

69 A reversed Carnot cycle working as a heat pump has a COP of 7. What is the ratio of minimum to maximum absolute temperatures?

(a) 7/8 (b) 1/6 (c) 6/7 (d) 1/7

70 For the function *xyz*, if $x+y+z=3$, then the local maximum for *xyz* occurs at the point:

(a) (4, ½, ½) (b) (5, -1, -1)

(c) (1, 1, 1) (d) (7, -3, -1)

71 The magnitude of maximum directional derivative of $\phi = 2xy^2 - xyz + y^2z$ in the direction from the point (1, -1, 1) is

(a) 62 (b) √52 (c) √62 (d) √56

72 The carburizing flame in gas welding as compared to oxidizing flame is:

(a) more luminous (b) less luminous

(c) equally luminous (d) unpredictable

73 In 18-4-1 HSS specification, 1 represents the percentage of:

(a) tungsten (b) vanadium

(c) carbon (d) chromium

74 In electrical discharge machining, the mechanism of material removal is:

(a) chemical reaction (b) breakdown of dielectric

(c) erosion of metal (d) None of the above

75. Negative rake angle is usually provided on which of the following tools:

(a) cemented carbide tools (b) high carbon steel tools

(c) HSS tools (d) all of the above

76. Which of the following welding processes uses non-consumable electrode?

(a) MIG welding (b) TIG welding

(c) Submerged arc welding (d) Manual arc welding

77. The differential equation whose solution is $z = (x-a)(y-b)$ is:

(a) $p = zq$ (b) $pq = 2z$

(c) $p = 2zq$ (d) $pq = z$

78. Continuous chip is formed when machining speed is:

(a) Low (b) Medium (c) High (d) any of the above

79. Hardness of carbon tool steels can be increased by alloying with

(a) Tungsten (b) Nickel

(c) Chromium and Vanadium (d) Manganese

80. The efficiency of superheat Rankine cycle is higher than that of simple Rankine cycle because

(a) The enthalpy of main steam is higher for superheat cycle

(b) The mean temperature of heat addition is higher for superheat cycle

(c) The temperature of steam in the condenser is high

(d) The quality of steam in the condenser is low

81. The cold working of metals is carried out

(a) below the recrystallisation temperature (b) above the recrystallisation temperature

(c) at the recrystallisation temperature (d) at sub-zero temperature

82. Which of the following statements is wrong:

(a) Larger side rake angle produces chipping.

(b) Smaller rake angle produces excessive wear and deformation in tool.

(c) The side cutting edge angle (less than 15^0) increases tool life.

(d) Increase in nose radius decreases tool life.

83 For converting electrical energy into mechanical energy, which of the following effects form the basis of Ultrasonic Machining process?

(a) Chemical action (b) Photosynthesis

(c) Piezoelectric effect (d) Polarization effect

84 The Laplace transform of $(t + 1)^3$ is:

(a) $(6-6s+3s^2-s^3)/s^3$ (b) $(6+6s+3s^2+s^3)/s$

(c) $(6+s+s^2+s^3)/s^4$ (d) $(6+6s+3s^2+s^3)/s^4$

85 The probability that a square selected at random from a 8x8 chessboard is of size 3x3 is:

(a) 8/51 (b) 3/17

(c) 14/17 (d) 25/204

86 A casting defect which occurs due to improper venting of sand is known as

(a) cold shut (b) swell

(c) air trap (d) blow holes

87 Gears are best mass produced by:

(a) Hobbing (b) Casting

(c) Forging (d) Milling

88 Which one of the following cycles has the highest thermal efficiency for given maximum and minimum cycle temperatures?

Brayton cycle (b) Otto cycle (c) Diesel cycle (d) Stirling cycle

89 In which of the following welding processes, the electrode gets consumed?

(a) Arc welding (b) TIG welding

(c) Resistance welding (d) Thermit welding

90 What is the function of the arbor of the milling machine?

(a) to hold the workpiece (b) to hold the cutting tool

(c) to hold the spindle (d) to hold the overarm

91 Two mating spur gears have 50 and 120 teeth respectively. The pinion rotates at 1100 rpm and transmits a torque of 20 Nm. The torque transmitted by the gear is:

(a) 6 Nm (b) 12 Nm (c) 48 Nm (d) 60 Nm

92 A closed system is one in which:

(a) mass does not cross boundaries of the system, though energy may do so

(b) mass crosses the boundary but not the energy

(c) neither mass nor energy cross the boundaries of the system

(d) both energy and mass cross the boundaries of the system

93 When two bodies are in thermal equilibrium with a third body, they are also in thermal equilibrium with each other. This statement is called:

(a) zeroth law of thermodynamics (b) first law of thermodynamics

(c) second law of thermodynamics (d) Kelvin Planck's law

94 According to First law of thermodynamics:

(a) total internal energy of a system during a process remains constant

(b) total energy of a system remains constant

(c) work done by a system is equal to the heat transferred by the system

(d) internal energy, enthalpy and entropy during a process remain constant

95 The dynamic load carrying capacity of a roller bearing is 20 kN. The desired life for 90% survival of the bearing is 8000 hours at a speed of 600 rpm. The equivalent radial load that the bearing can carry is:

(a) 3.658 kN (b) 4.924 kN (c) 5.168 kN (d) 6.734 kN

96 For any reversible process, the net entropy change is:

(a) zero (b) positive (c) negative (d) infinite

97 With the increase in pressure:

(a) enthalpy of dry saturated steam first increases and then decreases

(b) enthalpy of dry saturated steam remains same

(c) enthalpy of dry saturated steam increases

(d) enthalpy of dry saturated steam decreases

98 Which of the following is the extensive property of a thermodynamic system?

(a) Pressure (b) Density

(c) Volume (d) Temperature

99 Under what conditions, change in the enthalpy of a system equals the heat supplied?

(a) standard temperature conditions (b) constant volume

(c) constant pressure (d) constant temperature

100 A uniform body 3 m long, 2 m wide and 1 m deep floats in water. If the depth of immersion is 0.6 m, then the weight of the body is:

(a) 3.53 kN (b) 35.3 kN (c) 33.5 kN (d) none of these

101 The metacentric height is the distance between the:

(a) centre of gravity of the floating body and the centre of buoyancy

(b) centre of gravity of the floating body and the metacentre

(c) centre of buoyancy and the metacentre

(d) original centre of buoyancy and the new centre of buoyancy

102 Venturimeter is used to:

(a) measure the velocity of a flowing liquid

(b) measure the pressure of a flowing liquid

(c) measure the discharge of liquid flowing in a pipe

(d) measure the pressure difference of liquid flowing between two points of a pipe

103 The velocity through a channel of circular section will be maximum when the depth of water is ..... the diameter of the circular channel.

(a) 0.81 times (b) 0.67 times (c) 0.34 times (d) 0.95 times

104 When linear programming problem is solved graphically, every corner value in the feasible region shows:

(a) An optimum solution (b) Alternate solution

(c) A basic feasible solution (d) Solution not depending on constraints

105 A Pelton wheel is:

(a) inward flow reaction turbine (b) inward flow impulse turbine

(c) outward flow impulse turbine (d) tangential flow impulse turbine

106 The maximum hydraulic efficiency of an impulse turbine is:

(a) $(1 + \cos \phi) / 2$ (b) $(1 - \cos \phi) / 2$ (c) $(1 + \sin \phi) / 2$ (d) $(1 - \sin \phi) / 2$

where ϕ is the angle of blade tip at outlet.

107 The specific speed of a turbine is the speed of an imaginary turbine, identical with the given turbine, which:

(a) delivers unit discharge under unit head

(b) delivers unit discharge under unit speed

(c) develops unit power under unit head

(d) develops unit power under unit speed

108 In a cantilever, carrying a load whose intensity varies uniformly from zero at the free end to w per unit run at the fixed end, the S.F. changes follow a:

(a) linear law (b) parabolic law

(c) cubic law (d) reciprocal law

109 In a simply supported beam carrying a uniformly distributed load of w per unit run over the whole span, the maximum B.M. is equal to:

(a) $wl^2/4$ (b) $wl^3/6$ (c) $wl^2/8$ (d) $wl^3/8$

110 In the case of cantilever, irrespective of the type of loading, the maximum bending moment and maximum shear force occurs at:

(a) fixed end (b) free end (c) middle point (d) any point

111. A clutch has outer and inner diameters 100 mm and 40 mm respectively. Assuming a uniform pressure of 2 MPa and coefficient of friction of liner material as 0.4, the torque carrying capacity of the clutch is

(a) 148 Nm (b) 196 Nm (c) 372 Nm (d) 490 Nm

112. Which one of the following is the value of helix angle for maximum efficiency of a square threaded screw?

(a) $45° + \phi$ (b) $45° - \phi$ (c) $45° - \phi/2$ (d) $45° + \phi/2$

113. Johnson's rule is applicable for planning a job shop for

(a) n machines and 2 jobs (b) 2 machines and n jobs

(c) n machines and n jobs (d) 1 machine and n jobs

114. Float is the term associated with:

(a) event (b) exact time of completion of an activity

(c) event or activity (d) activity

115. In the case of a vertical belt pulley drive with T_c as centrifugal tension and T_o as the initial tension, the belt would tend to hang clear of the tower pulley when

(a) $T_c < T_o$ (b) $T_c < T_o/3$ (c) $T_c > T_o$ (d) $T_c < T_o/2$

116. In a vapour compression refrigeration plant, the refrigerant leaves the evaporator at 195 kJ/kg and the condenser at 65 kJ/kg. For 1 kg/s of refrigerant, the refrigeration effect is:

(a) 70 KW (b) 100 KW (c) 130 KW (d) 160 KW

117. In a flat belt drive, the belt can be subjected to a maximum tension T and centrifugal tension T_c . The condition for the transmission of maximum power is:

(a) $T = T_c$ (b) $T = \sqrt{3}\, T_c$ (c) $T = 2T_c$ (d) $T = 3T_c$

118. A product is priced at Rs. 125. The labour cost and material cost amounts to Rs. 85 per unit produced. If the fixed cost for the production facility is Rs. 25000, the break even point is:

(a) 1000 units (b) 850 units (c) 550 units (d) 625 units

119. A job has a normal time of 10 minutes. The performance rating fraction of the worker is 0.8. If allowance permitted is 20%, the standard time is:

(a) 11.2 min (b) 11.6 min (c) 12.5 min (d) 12 min

120. The study which is concerned with the reduction of work content in an operation is:

(a) Time study (b) Motion study

(c) Method study (d) Work measurement