001 In the sentence given below, fill in the blanks with the set of words which best fits the meaning of the sentence as a whole. $\qquad$ about prolonged power cuts in the urban areas, the authorities have decided to $\qquad$ over to more reliable and ecofriendly systems to run its pumps.
(A) Worried, shift
(B) Frantic, move
(C) Troubled, jump
(D) Concerned, switch

002 Choose the word / group of words which is most similar in meaning to the word given below:-
'FOSTERING'
(A) neglecting
(B) sidelining
(C) nurturing
(D) ignoring

003 Choose the word which is most opposite in meaning to the word given below:-
'CUMBERSOME'
(A) handy
(B) breathtaking
(C) awkward
(D) difficult

004 Which of the phrases given below should replace the phrases underlined in the following sentence, to make sentence grammatically correct. If the sentence is correct as it is and no correction required choose option-D. "As the time were hard for all, the country was generally making progress,"
(A) Since the times were
(B) Because the time was
(C) Though the times were hard
(D) No correction required

005 One of the words given in options may be wrongly spelt. Please identify it. If all four words are correctly spelt, mark 'B' as the answer
(A) Defamation
(B) None
(C) Solitude
(D) Exhorbitant

006 The position of how many letters in the word "WONDERFUL" will remain unchanged when the letters within the word are arrange alphabetically?
(A) None
(B) One
(C) Two
(D) Three

007 Select the correct sentence
(A) It is less than this.
(B) It is more less than this.
(C) It is lesser than this.
(D) It is as less as this.

008 Fill in the blank with appropriate option given. " $\qquad$ does he sing song when they praise"
(A) No sooner
(B) As soon as
(C) Hardly
(D) While

009 Fill in the blank
"Teacher asked students $\qquad$ "
(A) to not do noise
(B) if they do homework
(C) that they do home work
(D) if they did home work

010 In this group of words, only one word is correctly spelt. Select the one with the correct spelling.
(A) Dessonance
(B) Dissonance
(C) Dessonance
(D) Disonance

011 What is the speed of light in air?
(A) $3,00,000 \mathrm{Km} /$ second
(B) $\mathbf{1 , 8 0 , 0 0 0 ~ K m} /$ second
(C) $\mathbf{2 , 2 5 , 0 0 0 ~ K m} /$ second
(D) $\mathbf{5 0 , 0 0 0 ~ K m} /$ second

012 What is the most basic unit of element?
(A) Compound
(B) Nuclear
(C) Atom
(D) Mixture

013 Packets of the potato chips are usually flushed with which one of the following gases to prevent rancidity?
(A) Carbon dioxide
(B) Hydrogen
(C) Nitrogen
(D) Oxygen

014 Which one among the following is not a luminous object?
(A) Sun
(B) Proxima Centauri
(C) Jupiter
(D) Alpha Centauri

015 Which one among the following is not a renewable energy source?
(A) Solar
(B) Wind
(C) Nuclear
(D) Hydroelectric

016 The speed of wind is measured by
(A) Wind vane
(B) Wind rose
(C) Barometer
(D) Anemometer

017 According to early Indian philosophers, what are the basic elements described in "Panch Tatva"
(A) Earth, fire, sky, gas and water
(B) Air, earth, fire, sky and water
(C) Gas, land, fire, sky and water
(D) Air, earth, fire, land and water

018 Which gas is commonly used for extinguishing fire?
(A) Ethane
(B) Carbon dioxide
(C) Oxygen
(D) Hydrogen

019 The ozone layer restricts $\qquad$
(A) Infrared radiation
(B) Green radiation
(C) Ultraviolet radiation
(D) None of these

020 A molecule in plants comparable to haemoglobin in animal is $\qquad$
(A) Carotene
(B) Chlorophyll
(C) Cellulose
(D) Cytochrome

021 Which kind of memory does a microprocessor possess?
(A) Volatile
(B) Non volatile
(C) Both
(D) None

022 What is a computer network within an organisation called ?
(A) Extranet
(B) Internet
(C) Intranet
(D) Petronet

023 Which one is example of volatile memory?
(A) PROM
(B) RAM
(C) EPROM
(D) ROM

024 Microsoft Word uses which font by default?
(A) Courier
(B) Arial
(C) Calibri
(D) Times

025 Which tool is used to compress big file into small.
(A) Windata
(B) Winzip
(C) Winspread
(D) None

026 What is called - "a set of instruction that a computer follows in order to perform a particular task."
(A) Computer
(B) CPU
(C) Program
(D) Hardware

027 If "MS Word: writer" then what is "MS PowerPoint: $\qquad$ "
(A) calc
(B) impress
(C) base
(D) draw

028 Which is not the cloud computing model?
(A) Paas
(B) Laas
(C) Baas
(D) Saas

029 ECG is example of which computer?
(A) Analog
(B) Digital
(C) Hybrid
(D) None

030 "An easy to remember name that's associated with a physical IP address on the internet" is called $\qquad$
(A) Protocol name
(B) Hyperlink name
(C) Server name
(D) Domain name

031 Which is identification sign of 'LINUX' operating system?
(A) Flamingo
(B) Kangaroo
(C) Penguin
(D) Eagle

032 Which is useful to create, read, update and delete data in database?
(A) DDL
(B) DML
(C) DQL
(D) DOS

033 A Web browser feature used to save a website's URL address for future reference.
(A) Ping
(B) Flash
(C) Blog
(D) Bookmark

034 Which computer language can perform the functions of DDL, DML and DQL
(A) XML
(B) SQL
(C) JAVA
(D) $\mathrm{C}++$

035 Find out which is correct
(A) $\mathrm{KB}>\mathrm{MB}>\mathrm{GB}>\mathrm{TB}>\mathrm{PB}$
(B) $\mathrm{KB}<\mathrm{MB}<\mathrm{GB}<\mathrm{TB}<\mathrm{PB}$
(C) $\mathrm{KB}<\mathrm{MB}<\mathrm{PB}<\mathrm{TB}<\mathrm{GB}$
(D) $\quad \mathrm{KB}<\mathbf{M B}<\mathbf{G B}<\mathbf{P B}<\mathbf{T B}$

036 If one desires to see form 7/12 of land record online which website one should visit?
(A) edhara.gov.in
(B) anylandrecord.gov.in
(C) anyror.gujarat.gov.in
(D) anyedharagujarat.gov.in

037 What does the second "C" indicate in an online railway reservation agency website IRCTC'?
(A) Coach
(B) Confirmation
(C) Corporation
(D) Count

038 Please arrange the following according to their digits in number from more to less.
(a) PIN
(b) AADHAR
(c) MOBILE
(d) ISD Code
(A) $a, b, c, d$
(B) $\mathrm{c}, \mathrm{b}, \mathrm{a}, \mathrm{d}$
(C) $b, a, c, d$
(D) b, c, a, d

039 How many maximum possible letter one email address can contain?
(A) 32
(B) 64
(C) 128
(D) 255

040 What can be format when language is Gujarati and font 'shruti'?
(A) ASCI
(B) unicode
(C) ISCII
(D) uninot

041 Which of the following not developed by National Payment Corporation of India
(A) UPI
(B) UMANG
(C) BHIM
(D) RuPay

042 When was financial emergency declared in India?
(A) 1991
(B) 1975
(C) 1962
(D) Never

043 Which among the following is not a power of RBI ?
(A) Inspection of Bank
(B) Nationalization of Banks
(C) Call of returns
(D) Control the lending policies of the bank

044 How many Districts, Talukas and villages are in Gujarat?
(A) 33, 212, 15521
(B) 26, 192, 18025
(C) 33, 252, 18225
(D) None of these

045 Find out the incorrect pair of places in Gujarat and for which they are famous.
(A) Dhordo - Rannotsav
(B) Jetpur - Botanical garden
(C) Pij - First TV broadcast centre
(D) Morbi - Ceramic industry

046 Arrange the pairs correctly for rivers and place/city on their banks.
River
Place

1. Tapi
a. Valsad
2. Gomti
b. Shamlaji
3. Auranga
c. Mandvi
4. Meshvo
d. Dwarka
(A) $1-\mathrm{a}, 2-\mathrm{b}, 3-\mathrm{c}, 4-\mathrm{d}$
(B) 1-c, 2-d, 3-b, 4-a
(C) $1-\mathrm{a}, 2-\mathrm{d}, 3-\mathrm{c}, 4-\mathrm{b}$
(D) 1-c, 2-d, 3-a, 4-b

047 Which among the following is correct about coral reefs?
a. It is significant part of ecosystem
b. It acts like sanctuary to marine life
c. It protects coastline from erosion
(A) a and b only
(B) a and c only
(C) c and d only
(D) $\quad a, b$ and $c$

048 "Kavaratti" is capital of $\qquad$
(A) Andaman Nicobar
(B) Daman \& Div
(C) Lakshadweep
(D) Goa

049 Identify which is not correct option in which Gujarat is largest producer.
(A) Tobacco
(B) Cotton
(C) Bajra
(D) Cumin

050 Recently in J\&K region resources of which mineral reserves were found?
(A) Uranium
(B) Limestone
(C) Manganese
(D) Lithium

051 Pairs showings article and contents are mentioned below. Which pairs are not correct?

1. Arti-15 - Equality before law.
2. Arti-18 - Abolition of titles
3. Arti-21-Right to education
4. Arti-25-Freedom to manage religious affairs.
(A) 1 and 2
(B) 1 and 3
(C) 1 and 4
(D) 1,3 and 4

Evaluate the statements:

1. Application of directive principles of state policy shall be enforceable by any court.
2. It is not necessary for the state to apply these principles in making laws.
(A) Only one is correct
(B) Only two is correct
(C) Both 1 and 2 are not correct
(D) Both 1 and 2 are correct

053 Evaluate the statements.

1. Under article 53, the executive power of the union shall be vested in the President.
2. Under article 153, the executive power of the state shall be vested in the Governor.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct

054 1. Establishment and constitution of the supreme court, are governed by article 123
2. Under article $\mathbf{1 2 9}$, supreme court is a court of records
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct

055 Arrange article and contents

Article
a. 148
b. 149
c. 150
d. 151

## Content

1. Audit reports
2. Comptroller and Auditor General of India (CAG)
3. Duties and Powers of CAG
4. Forms of accounts of Union
(A) $\mathrm{a}-2, \mathrm{~b}-3, \mathrm{c}-4, \mathrm{~d}-1$
(B) $\mathrm{a}-3, \mathrm{~b}-4, \mathrm{c}-1, \mathrm{~d}-2$
(C) $\mathrm{a}-4, \mathrm{~b}-1, \mathrm{c}-2, \mathrm{~d}-3$
(D) $\mathrm{a}-1, \mathrm{~b}-2, \mathrm{c}-3, \mathrm{~d}-4$

056 The Right to Information act is called as "The Right to Information Act $\qquad$
(A) 2004
(B) 2005
(C) 2006
(D) 2007

057 Rights of Information and obligation of public authorities, are mentioned under $\qquad$ section of RTI Act.
(A) 8
(B) 6
(C) 4
(D) 2

The provision for, exemption from disclosure of information is mentioned under which provision of RTI Act?
(A) 8
(B) 9
(C) 10
(D) 11

059 Section 11 of RTI Act, provides for:-
(A) Severability
(B) Third party information
(C) Constitution of central information commission
(D) Constitution of state information commission

060 The provision for appeal under RTI act is made under $\qquad$ section.
(A) 22
(B) 21
(C) 20
(D) 19

061 Which country is set to export $10,000 \mathrm{MW}$ of power to India in next 10 years, solidifying long term energy partnership.
(A) Nepal
(B) Bhutan
(C) Bangladesh
(D) Sri Lanka

062 Which Indian state has become the first to map all accident prone sites, using the Mappls app for road safety?
(A) Maharashtra
(B) Punjab
(C) Karnataka
(D) Tamil Nadu

063 Which company won the CII national award for excellence in water management recently?
(A) Bajaj Auto
(B) TVS Motor Co.
(C) Yamaha Motor Co.
(D) Hero MotoCorp.

064 In which Indian state was a 10th century inscription found, written is both Kanada and Sanskrit?
(A) Kerala
(B) Tamil Nadu
(C) Goa
(D) Karnataka

065 Who has been honoured with the 2023, Kuvempu Rashtriya Award?
(A) Jhumpa Lahiri
(B) Shrishendu Mukhopadhyay
(C) Arundhati Roy
(D) Chetan Bhagat

066 What is the name of the comprehensive scheme launched under the ministry of Earth Science?
(A) Earth Quest
(B) Prithvi
(C) Science Vision
(D) Geo Explorer

067 Which Indian state has launched the nation's first ever report and meeting management portal?
(A) Karnataka
(B) Maharashtra
(C) Tamil Nadu
(D) Himachal Pradesh

068 What government department is responsible for launching the PRERANA Programme?
(A) Ministry of Education
(B) Ministry of Finance
(C) Ministry of Health and Family Welfare
(D) Ministry of Child \& Woman Development

069 In which Indian state is Adidas establishing it's first and only Global capacity Centre (GCC) in Asia outside China?
(A) Maharashtra
(B) Karnataka
(C) Tamil Nadu
(D) Gujarat

070 On which date is "World Braille Day" is observed?
(A) January - 3
(B) January - 4
(C) January - 5
(D) January - 6

071 Evaluate the statements:-

1. The council of Industry academia collaboration was by govt. resolution in 2017.
2. This programme will help in personal and professional life.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct.

072 From the following which is not correct statement for knowledge consortium of Gujarat.
(A) It is a platform to share knowledge
(B) Capacity building of students
(C) Connect education institutes, knowledge network
(D) Implement new education policy.

073 From the following articles of Indian Constitution, which is not connected with education?
(A) Article - 14
(B) Article - 15
(C) Article - 21A
(D) Article - 28

074 From the following, which organisations are connected with education?

1. CBSE
2. CTSA
3. NVS
4. NCTE
(A) 1,2 and 3
(B) 2,3 and 4
(C) 1,2 and 4
(D) 1,2,3 and 4

From the following, which are apex level bodies

1. AICTE
2. COA
3. ICHR
4. ICSSR
(A) 1, 2, 3 and 4
(B) 1,2 and 3
(C) 1,2 and 4
(D) 1,3 and 4

076 The pairs showing, Boards of Apprenticeship Training and its location, are mentioned below. Which pair is not correct?
(A) BOAT - Mumbai
(B) BOAT - Chennai
(C) BOAT - Kolkata
(D) BOAT - New Delhi

077 Indian Institute of Technology (IIT) is not situated at:-
(A) Gandhinagar
(B) Guwahati
(C) Indore
(D) Pune

078 Pairs showing NIT's and locations, are as under, which are correct pairs?

1. NIT- Agartala
2. Motilal Nehru NIT, Allahabad
3. NIT Durgapur
(A) 1 and 2
(B) 2 and 3
(C) 1 and 3
(D) 1,2 and 3
4. The main aim of Regional Engineering college, was to create skilled man power for Engineering and Technology organization.
5. At present there are 40 NIT's.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct

080 1. The Indian Institute of Management Act was passed in 2017.
2. The objects of institutes are mentioned in section 6 of the Indian Institute of Management Act.
(A) Both 1 and 2 are not correct
(B) Both 1 and 2 are correct
(C) Only 1 is correct
(D) Only 2 is correct.

081 1. IIM Calcutta was established in 1961.
2. First Indian Institute of Technology was established is 1950 . Evaluate the statements.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct

1. There is one Indian Institute of Science IISC in Bangalore
2. There are 7 institute of science Education and Research in the nation in the year 2022.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are not correct
(D) Both 1 and 2 are correct
3. The first National Institute of Technical Teachers training and Research, was established in 1975 at Jaipur.
4. The Govt. of India, accorded them national status in 2005
(A) Only 1 is correct
(B) Only 2 is Correct
(C) Both 1 and 2 are not correct
(D) Both 1 and 2 are correct
5. University Grants Commission came into existence on $28{ }^{\text {th }}$ December 1953
6. UGC became statutory body in 1956
(A) Both 1 and 2 are correct
(B) Both 1 and 2 are not correct
(C) Only 1 is correct
(D) Only 2 is correct

085 1. National higher education qualifications frame work is an initiative of UGC.
2. In UGC there are $\mathbf{3}$ members and a chairman.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are not correct
(D) Both 1 and 2 are correct

1. All India council for teachers' education was set up in 1945.
2. All India council for technical education was established for promotion of quality in technical education and for better planning and coordination in technical education system.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct

087 1. Pharmacy council of India was constituted on 9-8-1949.
2. It aims at regulating pharmacy education, profession and practice in pharmacy.
(A) Both 1 and 2 are Correct
(B) Only 1 is correct
(C) Only 2 is correct
(D) Both 1 and 2 are not correct.

1. Bar council of India, is a constitutional body.
2. It was established under the Advocates Act 1961.
(A) Both 1 and 2 are not correct
(B) Both 1 and 2 are correct
(C) Only 2 is correct
(D) Only 1 is correct

089 1. The Indian Nursing Council was registered under the Indian Nursing Council Act 1947
2. Council aims for uniform standard of training for nurses midwives and health visitors.
(A) Both 1 and 2 are not correct
(B) Only 1 is correct
(C) Only 2 is correct
(D) Both 1 and 2 are correct

1. Medical Commission Act 2019 came into force on 25-9-2020.
2. The goal of the commission is to improve access to the quality and affordable medical education.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct
3. Dental Council of India is constitutional body.
4. Dental Council of India is formed as per section 3 of the act.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct

092 1. Veterinary Council of India receives $100 \%$ grant in aid form government.
2. It is working under Department of Animal Husbandry and Dairying.
(A) Both 1 and 2 are not correct
(B) Both 1 and 2 are correct
(C) Only 1 is correct
(D) Only 2 is correct

1. Rashtriya Uchchatar Shiksha Abhiyan (RUSA) was launched in 2015
2. It provides strategic funding to state Institute
3. It ensures reform in affiliation academic and exam system.
(A) 1 and 2 are correct
(B) 1 and 3 are correct
(C) 2 and 3 are correct
(D) 1, 2 and 3 are correct
(1) National education policy of 1986 was modified in 1992.
(2) New education policy was introduced is 2020 , for massive transformation
(A) Both 1 and 2 are correct
(B) Both 1 and 2 are not correct
(C) Only 1 is correct
(D) Only 2 is correct
(1) Higher Education Financing Agency (HEFA) provides finance for educational infrastructure and R \& D.
(2) It is Joint venture of ICICI Bank, SBI and Ministry of Education
(A) Both 1 and 2 are correct
(B) Both 1 and 2 are not correct
(C) Only 2 is correct
(D) Only 1 is correct
(1) HEFA is not for profit organization.
(2) HEFA accepts CSR fund.
(3) It helps premier institutions and institutions under IMPRINT, UAY, FAST etc.
(A) 1 and 2 are correct
(B) 2 and 3 are correct
(C) 1 and 3 are correct
(D) 1,2 and 3 are correct
1) National Board of Accreditation (NBA) was established in 1994.
2) Accreditation is a process of quality assurance and improvement for professional courses.
3) NIRF was developed in 2015.
(A) 1 and 2 are correct
(B) 2 and 3 are correct
(C) 1 and 3 are correct
(D) 1, 2 and 3 are connect
(1) The first edition of Indian Ranking was released in 2016.
(2) Ranking has 8 categories.
(3) Last ranking was released in December 2022.
(A) 1 and 2 are not correct
(B) 2 and 3 are not correct
(C) 1 and 3 are not Correct
(D) 1, 2 and 3 all are correct

099 (1) Gujarat Technology University was established by Act of 2007.
(2) It is accredited with A+ grade by NAAC
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct
(1) GTU has 486 affiliated colleges
(2) Excellence with value-based education, responsiveness to society, mutual respect are same of core values of GTU.
(A) Only 1 is correct
(B) Only 2 is correct
(C) Both 1 and 2 are correct
(D) Both 1 and 2 are not correct

101 What is the major attribute of correlation analysis
(A) Difference among variables
(B) Association among variables
(C) Regression among variables
(D) Variations among variables

102 What is the name of the conceptual framework in which the research is carried out?
(A) Research hypothesis
(B) Synopsis Research
(C) Research paradigm
(D) Research design

103 Which of the following features are considered as critical qualitative research \&
(A) Collecting data with the help of standardized research tools
(B) Design sampling with probability sample techniques.
(C) Collecting data with bottom-up empirical evidence
(D) Gathering data with top-down schematic evidence

104 In order to purse the research, which of the following is priorly required
(A) Developing a research design
(B) Formulating a research question
(C) Deciding about the data analysis procedure
(D) Formulating a research hypothesis

105 Which of the following is not a common type of quantitative research design?
(A) Correlational
(B) Experimental
(C) Case study
(D) Quasi-experimental

106 Which of the following is not a key characteristics of quantitative research
(A) objective
(B) systematic
(C) subjective
(D) structured

107 Which of the following is not a method of quantitative research
(A) Grounded theory research
(B) Correlational research
(C) Quasi-experimental research
(D) Experimental research

108 Which of the following is not a type of non-probability sampling
(A) Snowball sampling
(B) Stratified random sampling
(C) Quota sampling
(D) Convenience sampling

109 When conducting a survey in quantitative research what is the typical format of the questions?
(A) Open-ended Questions
(B) Unstructured Questions
(C) Yes-or-No-Questions
(D) Close-ended Questions

110 A research problem is feasible only when
(A) It is researchable
(B) It is new and adds something to knowledge
(C) It has utility and relevance
(D) All of these

111 Hypothesis can not be stated in
(A) General terms
(B) Declaration terms
(C) Null and Questions terms
(D) Directional terms
(A) Data
(B) Sample
(C) Research Tools
(D) Research Design

113 Research design that needs to collect factual information on a continuing basis is classified as
(A) Longitudinal study design
(B) Pre and post study design
(C) Cross-sectional Study design
(D) Double-control study design

114 The qualitative research design involves
(A) Cohort design
(B) Experimental design
(C) Emergent design
(D) Correlative design

115 Research design strategy encompasses all of the components below except:
(A) Data collection design
(B) Sampling design
(C) Instrument development
(D) Data analysis

116 What is the difference between a quantitative and qualitative research design?
(A) The type of data collected
(B) The methods used for data collection
(C) The methods used for data analysis
(D) All of the above

117 Probability sampling is rarely used in qualitative research because
(A) Qualitative researchers are not trained in statistics
(B) It is very old-fashioned
(C) It is often not feasible
(D) Research questions are more important than sampling

118 Which of the following factors should be considered when evaluating the validity of a research study?
(A) The credibility of the researcher
(B) The significance of the research findings
(C) The internal consistency of the data and external applicability of the findings
(D) All of the above

119 The best graphical way to present data related to different levels of certain Variable is
(A) Pictogram
(B) Pie chart
(C) Histogram
(D) Frequency polygon

120 When a research study is conducted to know about an unknown areas and collect information. It is known as
(A) Pilot study
(B) Feasibility study
(C) Explanatory research
(D) Exploratory research

121 Which of the following is not a type of research report
(A) Thesis / Dissertation
(B) Research paper
(C) Text-book of subject
(D) Conference / Seminar research paper

122 The objective of citation style manuals is
(A) Attribution of own intellectual work
(B) Attribution of other's intellectual work
(C) Attribution of corporate intellectual outcomes
(D) All of these

International standard Book Number (ISBN) is a $\qquad$ digit unique numeric commercial machine-readable identification number meant for monograph publications
(A) Eight
(B) Ten
(C) Eleven
(D) Thirteen

124 Who is responsible for assessing ISBN in India?
(A) National Library, Kolkata
(B) Imperial library, Kolkata
(C) Raja Ram Mohan Roy Foundation, Kolkata
(D) National Book Trust, New Delhi

125 What does ethics impose on research?
(A) To have in its center the satisfaction of the target group
(B) Obtain a considerable profit
(C) Frequent appearances on social media
(D) To have in its center the achievement of the objectives

126 Scientific development research is applied based on the obtained results in the research
(A) Interdisciplinary research
(B) Applicative research
(C) Individual research
(D) Fundamental research

127 Which of the following is a type of research grouped according to the researcher's criteria?
(A) Fundamental research
(B) Self funded research
(C) Short - term research
(D) Individual research

128 In research, what exactly should we estimate?
(A) Research objective
(B) Research costs
(C) The partners we will collaborate with
(D) None of the above

129 Free will is a category
(A) of ethics
(B) of sports law
(C) of commercial law
(D) of political law

130 Which among the following is not a kind of a plagiarism?
(A) Patch writing
(B) Untainted Plagiarism
(C) Indirect Plagiarism
(D) Direct Plagiarism

131 In which of the following ways can be the relation be represented?
(A) as a matrix
(B) as a directed graph
(C) as an arrow diagram
(D) All of above

132 If a relation is symmetrical, reflexive and transitive then it is known as
(A) Symmetrical Relation
(B) Equal Relation
(C) Equivalence Relation
(D) None of above

133 Degree of Recurrence relation is
(A) One
(B) Two
(C) Three
(D) Infinite

134 What is the order of the equation $a_{\mathrm{r}+3}+6 a_{\mathrm{r}+2}+12 a_{\mathrm{r}+1}+8 a_{\mathrm{r}}=0$ ?
(A) 0
(B) 1
(C) 2
(D) 3

135 Permutation of $r$ and $n$ positive integers where $r \leq n$ is denoted by?
(A) $\quad \mathbf{P}(\mathbf{n}, \mathbf{r})$
(B) $\quad \mathbf{P}(\mathbf{r}, \mathbf{n})$
(C) $\quad \mathbf{C}(\mathbf{n}, \mathbf{r})$
(D) None of above

136 For the matrix
$A=\left[\begin{array}{lll}1 & 3 & 5 \\ 4 & 6 & 7 \\ 1 & 2 & 2\end{array}\right]$
Find $|\mathrm{A}|=$ ?
(A) 2
(B) 3
(C) 4
(D) None of above

137 Which contains two equal sets ?
(A) $X=\{5,6\}$ add $Y=\{6\}$
(B) $\quad X=\{5,6,8,9\}$ and $Y=\{6,8,5,9\}$
(C) $X=\{5,6,9\}$ and $Y=\{9,6,5\}$
(D) Both (B) and (C)

138 For symmetric matrix, which is correct ?
(A) $A=($ transpose of $A)$
(B) All diagonal elements are 1
(C) $\quad A=-($ transpose of $A)$
(D) None of above

139 The determinant of the matrix whose eigen values are 7, 1, 9 is
(A) 7
(B) 63
(C) 9
(D) 17

140 What is the value of $\lim _{y \rightarrow \infty} \frac{2}{y}$ ?
(A) 0
(B) 1
(C) 2
(D) None of above

141 Find integral of $8 x^{3}+1$
(A) $2 x^{4}+x+C$
(B) $2 x^{6}-5 x+C$
(C) $2 x^{4}-x+C$
(D) $\quad 2 x^{4}+x^{2}+\mathrm{C}$

142 What is the median of following data
2, 7, 4, 8, 9, 10, 6, 12, 13 ?
(A) 11
(B) 8
(C) 9
(D) $\mathbf{1 0}$

143 What is the saddle point?
(A) point where function has maximum value
(B) point where function has minimum value
(C) point where function value is zero
(D) point where function is neither maximum nor minimum

144 According to Rolle's theorem, function $f$ should be $\qquad$ on [a, b].
(A) continuous
(B) non-continuous
(C) integral
(D) non-existent

145 The mode of the data 21, 26, 22, 29, 23, 29, 26, 29, 22, 33 is
(A) 21
(B) 29
(C) 23
(D) 26

146 Two un-biased coins are tossed. What is the probability of getting at most one head?
(A) $1 / 2$
(B) $3 / 4$
(C) $1 / 3$
(D) None of above

147 Company A produces $\mathbf{1 0 \%}$ defective products, Company B produces $\mathbf{2 0 \%}$ defective products and Company $\mathbf{C}$ produces $5 \%$ defective products. If choosing a Company is an equally likely event, then what is the probability of defective product chosen?
(A) 0.11
(B) 0.21
(C) 0.22
(D) 0.12

148 When rolling a fair six-sided die, what is the probability of obtaining an even number?
(A) $1 / 6$
(B) $\quad 1 / 3$
(C) $\quad 1 / 2$
(D) $\quad 2 / 3$

149 What is the probability of drawing a red card or a card with a face King, Queen or Jack from a standard deck of $\mathbf{5 2}$ cards?
(A) $13 / 52$
(B) $\quad 21 / 52$
(C) 29/52
(D) $32 / 52$

150 What is probability?
(A) Total number of possible outcomes in an event
(B) The ratio of favorable outcomes to all outcomes
(C) The chance of an event happening
(D) All of above

151 A multiplexer with a 4-bit data select input is a
(A) 2:1 multiplexer
(B) 4:1 multiplexer
(C) $8: 1$ multiplexer
(D) $16: 1$ multiplexer

152 The value of following expression is :
$\left((\mathbf{A B})^{\prime}+\mathbf{A}^{\prime}+\mathbf{A B}\right)^{\prime}$
(A) 1
(B) 0
(C) A
(D) None of the above

153 Consider the Boolean function $f(\mathrm{a}, \mathrm{b}, \mathrm{c})=\mathbf{a}^{\prime}+\mathrm{bc}^{\prime}+\mathrm{b}^{\prime} \mathrm{c}$. The canonical Sop form of $f$ is
(A) $\quad \Sigma(0,1,2,3,5,6)$
(B) $\quad \Sigma(0,1,3,5,6,7)$
(C) $\quad \Sigma(0,1,2,3,4,5)$
(D) $\quad \Sigma(2,3,4,5,6)$

154 Which of the following set of operations is/are functionally complete?
(A) AND, NOT
(B) OR, NOT
(C) AND, OR, NOT
(D) All of the above

155 The greatest negative number which can be stored in a computer that has 8 -bit word length and uses 2 's complement arithmetic is
(A) - $\mathbf{1 2 7}$
(B) -128
(C) -255
(D) $\mathbf{- 2 5 6}$

156 (FE) $)_{16}-(88)_{16}$ is
(A) $\quad(5 \mathrm{E})_{16}$
(B) $\quad(\mathbf{7 5})_{16}$
(C) ${ }_{(76)}{ }_{16}$
(D) None of the above

157 Hamming distance between two successive gray code is
(A) 0
(C) 2
(D) 3

158 Race around condition is avoided in
(A) SR flip-flop
(B) JK flip-flop
(C) Master slave JK flip-flop
(D) None of the above
$\qquad$ flip-flops are required to construct a mod-60 counter.
(A) 3
(B) 4
(C) 5
(D) 6

160 Shift left by n-position is equivalent to
(A) multiplication by $\mathbf{n}$
(B) multiplication by $2^{\mathbf{n}}$
(C) division 88 by $n$
(D) division by $2^{\mathbf{n}}$

161 The minimized expression to convert a T to flip-flop JK flip-flop is
(A) $\quad T=K Q$
(B) $\quad T=J \bar{Q}+K Q$
(C) $\quad T=J \bar{Q}+\bar{K} Q$
(D) $\quad T=J Q+K \bar{Q}$

162 JK flip-flop can be used as
(A) T flip-flop
(B) D flip-flop
(C) Both (A) and (B)
(D) None of the above

163 A mod-6 synchronous counter is designed using JK flip-flop. The number of counts it will skip is
(A) 1
(B) 2
(C) 4
(D) 8

164 Zero has two representations in
(A) 1's complement
(B) 2's complement
(C) Both (A) and (B)
(D) None of the above

165 Let $f(A, B)=A^{\prime}+B$, simplified expression for function $f(f(x+y, y), z)$ is
(A) $\mathbf{x}^{\prime}+\mathbf{z}$
(B) xyz
(C) $\mathrm{xy}^{\prime}+\mathrm{z}$
(D) None of the above

166 Which are the essential prime implicants of the following boolean function?
$f(\mathbf{a}, \mathrm{~b}, \mathrm{c})=\mathbf{a}^{\prime} \mathbf{c}+\mathbf{a c}{ }^{\prime}+\mathrm{b}^{\prime} \mathbf{c}$
(A) a'c and ac'
(B) a'c and b'c
(C) a'c only
(D) ac' and bc'

167 Computer organization deals with
(A) Data formats
(B) Addressing modes
(C) Logical design of the system
(D) None of the above

168 Which of the following actually controls the path of signals or data within computer?
(A) Machine language programming
(B) Micro programming
(C) System Programming
(D) Assembly language programming

169 Program status Word (PSW) represents status of
(A) Control unit
(B) CPU
(C) ALU
(D) None of the above

170 If one instruction is executed in $4 n s e c$, what is the throughput of the system?
(A) 150 MIPS
(B) 200 MIPS
(C) 250 MIPS
(D) 1000 MIPS

171 RISC processors are characterized by
(A) Data transfer instructions are limited to load \& store
(B) Delayed loads and branches
(C) Prefetch and Speculative execution
(D) All of the above

172 Match the following pairs in most appropriate way.
X : Indirect addressing

1. Loops

Y : Immediate addressing
2. Pointers

Z : Auto Decrement addressing
3. Constants
(A) X-2, Y-3, Z-1
(B) X-3, Y-2, Z-1
(C) X-1, Y-2, Z-3
(D) $\mathrm{X}-3, \mathrm{Y}-1, \mathrm{Z}-2$

173 The most relevant addressing mode to write position-independent code is
(A) Direct mode
(B) Indirect mode
(C) Relative mode
(D) All of the above

174 A processor needs software interrupt to
(A) implement co-routines
(B) obtain system services which need execution of privileged instructions
(C) return from subroutine
(D) test the interrupt system of the processor

175 The property of locality of reference may fail if a program has
(A) Many conditional jumps
(B) Many unconditional jumps
(C) Both (A) and (B)
(D) None of the above

176 The bit used to signify that cache location is updated is $\qquad$
(A) Update bit
(B) Flag bit
(C) Change bit
(D) Dirty bit

177 Minimum size of ROM required to store the complete truth table of an 8 -bit $\times 8$-bit multiplier is
(A) $32 \mathrm{~K} \times 16$ bits
(B) $64 \mathrm{~K} \times 16$ bits
(C) $16 \mathrm{~K} \times 32$ bits
(D) $64 \mathrm{~K} \times 32$ bits

Which of the following DMA transfer modes and interrupt handling mechanism will enable the highest I/O band-width ?
(A) Transparent DMA and Polling interrupts
(B) Cycle-stealing and Vectored interrupts
(C) Block transfer and Vectored interrupts
(D) Block transfer and Polling interrupts

179 Which of the following is true for associative memory a
(A) Data are accessed sequentially
(B) Address of the data is generated by CPU
(C) Address of the data is given by user
(D) No need for address data is used as address
$\qquad$ memory has largest storage capacity.
(A) Primary memory
(B) Auxiliary memory
(C) Cache memory
(D) Associative memory

181 Flynn's computer classification is based on
(A) single or multiple instruction streams
(B) single or multiple data streams
(C) single or multiple streams of instruction and data
(D) None of the above

182 In an instruction execution pipeline, The earliest that the data TLB (Translation Lookaside Butter) can be accessed is
(A) Before effective address calculation has started
(B) During effective address calculation
(C) After effective address calculation has completed
(D) None of the above
int main()
\{
printf("\%x", main:
return 0;
\}
The output of above code is
(A) An execution error
(B) An infinite loop
(C) Starting address of function main
(D) None of the above
void main()
\{
int $a=4, b=2$;
printf("\%d", a+++b);
\}
The output is
(A) 6
(B) 7
(C) Error
(D) None of the above

185 Heap allocation is required for languages
(A) Supporting recursion
(B) Supporting dynamic data structures
(C) Supporting dynamic scope rules
(D) None of the above

186 What error does following for action produce?
int fun(int $a$, int $b$ )
\{
int a;
$\mathrm{a}=20$;
return a;
\}
(A) Missing paranthesis in return statement
(B) Redeclaration of variable a
(C) Compile without error
(D) None of the above

187 What will be output of following if size of integer is 2 bytes ?
void main() \{
int $p[]=\{2,4,6,8,10\}$;
printf("\%d \%d", *p, sizeof (p));
\}
(A) 220
(B) 25
(C) 210
(D) can't say
void main()
\{
int $a=4, b, c$;
$\mathrm{a}^{*}=\mathrm{b}=\mathrm{c}=3$;
printf("\%d", a);
\}
Give output of above
(A) 3
(B) 4
(C) Error
(D) 12

189 Which of the following data structure is used by C language to pass function parameters?
(A) Array
(B) Stack
(C) Queue
(D) Linked list

190 The postfix equivalent of the prefix * $+\mathrm{ab}-\mathrm{cd}$ is
(A) $\mathbf{a b}+-\mathbf{c d}$ *
(B) $\quad \mathrm{ab}+\mathrm{cd}{ }^{*}-$
(C) abcd+ - *
(D) $\mathbf{a b}+\mathbf{c d}$-*

191 Which of the following data structure is used inherently in implementing quick sort ?
(A) Stack
(B) Queue
(C) linked list
(D) tree

192 In a complete binary tree, if number of nodes is 15 then the height of the tree is,
(A) 2
(B) 3
(C) 4
(D) 5

193 In heap tree, the bottom level should be filled
(A) completely
(B) from right to left
(C) from left to right
(D) None of the above

194 Give the post order traversal of the binary tree having preorder and inorder traversal as Inorder : BEAFDCHG
Preorder : DBAEFGCH
(A) EFBAHCGD
(B) EFABHCGD
(C) EFBAHGCD
(D) None of the above

195 Assume that following are the sequences resulted using the inorder and preorder traversal of a binary tree
Inorder : 5710131517
Preorder : 1057151317
How many nodes are in right subtree?
(A) 3
(B) 4
(C) 2
(D) alone of the above

196 Which of the following is not a graph traversal method?
(A) DFS
(B) BFS
(C) Postorder
(D) All are graph traversal methods

197 Which of the following property is used by binary search but ignored by linear search?
(A) Maximum value of the list
(B) Minimum value of the list
(C) Length of the list
(D) Median of the list

198 For array $A(3: 7)$, if the base address is 4000 and size of each element is 4 bytes, what is the address of third element?
(A) 4004
(B) 4008
(C) 4012
(D) 4016

199 Which of the following sorts have a $0(\mathrm{n} \log \mathrm{n})$ worst case performance?
(A) Insertion
(B) Quick
(C) Heap
(D) None of the above

200 Which of the following statements is false?
(A) Heap sort uses a min-heap for sorting elements in ascending order
(B) A sorted array is mean-heap
(C) Both (A) and (B)
(D) None of the above

201 Bellman ford algorithm does not work for graphs
(A) That contains negative weight edges
(B) That contains negative weight cycles
(C) That contains more than one articulation points
(D) None of the above

202 Analyzing of an algorithm means
(A) predicting the output of the algorithm
(B) predicting the finiteness of an algorithm
(C) predicting the resources that the algorithm needs
(D) None of the above
$203 \quad \mathbf{f}(\mathbf{n})=\Omega(\mathbf{g}(\mathbf{n}))$ is
(A) $\quad g(n)$ is asymptotic lower bound for $f(n)$
(B) $\quad g(n)$ is asymptotic tight bound for $f(n)$
(C) $\quad g(n)$ is asymptotic upper bound for $f(n)$
(D) None of the above

204 If $f(n)=3 n^{2}+4 n+2$, then $f(n)=$
(A) $\quad \mathbf{O}(\mathrm{n})$
(B) $\quad \mathbf{O}\left(\mathbf{n}^{2}\right)$
(C) $\Omega\left(\mathbf{n}^{3}\right)$
(D) $\theta\left(\mathbf{n}^{2}\right)$

205 The average case occurs in linear search algorithm when
(A) Item is not in the array at all
(B) Item is somewhere in the middle of the array
(C) Item is the last element in the array
(D) All of the above

206 What will be the complexity of following algorithm?
int $f($ const unsigned int $n)\{$
if ( $n<=1$ )
return (1);
else return (fib(n-1) + fib (n-2));\}
(A) $\quad \mathbf{O}\left(\mathbf{n}^{2}\right)$
(B) $\quad \mathbf{O}\left(\mathbf{n}^{3}\right)$
(C) $\quad \mathbf{O}\left(\mathbf{n}^{2} \log \mathrm{n}\right)$
(D) $\quad \mathbf{O}\left(2^{n}\right)$

207 Which of the following is not a backtracking algorithm?
(A) Knight tour problem
(B) $\mathbf{N}$ queen problem
(C) Tower of hanoi
(D) M coloring problem

208 Which of the following sorting algorithms provide the best time complexity in the worst-case scenario?
(A) Quick sort
(B) Merge sort
(C) Bubble sort
(D) All of the above

209 Which of the approach is followed by Floyd Warshall's algorithm?
(A) Linear programming
(B) Backtracking
(C) Greedy technique
(D) Dynamic Programming

210 What is the technique called in which it does not require extra memory for carrying out the sorting procedure?
(A) Stable
(B) In-partition
(C) In-place
(D) None of the above

211 What is the best time complexity we can achieve to precompute all-pairs shortest paths in a weighted graph?
(A) $\mathbf{O}\left(\mathbf{n}^{2}\right)$
(B) $\quad \mathrm{O}\left(\mathrm{n}^{3}\right)$
(C) $\quad \mathrm{O}\left(\mathrm{n}^{4}\right)$
(D) None of the above

212 Which of the following is known to be not an NP - Hard problem?
(A) 0/1 Knopsack problem
(B) Travelling salesman problem
(C) Vertex cover problem
(D) All of the above

213 The recurrence relation capturing the optimal time of the Tower of Hanoi problem with $n$ disc is
(A) $\quad T(n)=2 T(n-2)+2$
(B) $\quad T(n)=2 T(n-1)+n$
(C) $\quad \mathbf{T}(\mathrm{n})=2 \mathrm{~T}(\mathrm{n} / 2)+1$
(D) $\quad T(n)=2 T(n-1)+1$

214 The tightest lower bound on the number of comparisons, in the worst case, for comparisonbased sorting is of the order of
(A) n
(B) $\mathbf{n}^{2}$
(C) $n \log n$
(D) None of the above

215 Which of the following is a dynamic programming problem?
(A) Depth first search
(B) Breadth first search
(C) Binary search
(D) None of the above

216 Which of the following is false?
(A) It is possible to construct an NFF with more number of states than its equivalent minimum DFA
(B) There can be a DFA with more than one start state
(C) Both (A) and (B)
(D) None of the above

217 The string 0100 belongs to the set represented by
(A) $110^{*}(0+1)$
(B) $1(0+1) * 101$
(C) $(10) *(01) *(00+11) *$
(D) $\quad(00+(11) * 0) *$

For regular sets
$A=\left((01) * 1^{*}\right)$ and
B=(01+1) *
Which of the following is true?
(A) $\quad \mathbf{A} \subset \mathbf{B}$
(B) $\quad \mathbf{B} \subset \mathbf{A}$
(C) $\quad \mathrm{A}=\mathrm{B}$
(D) A and B are incompatible

219 Which of the following is false?
(A) Regular sets are closed under complementation
(B) Regular sets are closed under intersection
(C) Regular sets are closed under reversal
(D) None of the above

220 Given $L_{1}=0^{*} 10^{*}$ and $L_{2}=0^{*} 1$. Find $L_{1} / L_{2}$
(A) 0 *
(B) 1
(C) $\mathbf{0}^{*} \mathbf{1}$
(D) 10 *

221 Which of the following is true?
(A) Every subset of a regular language is regular
(B) Every regular language has a regular proper set
(C) Both (A) and (B)
(D) None of the above

222 Consider the regular expression:
$\mathbf{R}=(\mathbf{a b} / \mathbf{a b b})^{*}$ bbab
Which of the following string is not in the set denoted by $R$ ?
(A) ababab
(B) abbbab
(C) abbabbbab
(D) ababbabbbab

223 Let $L$ be language recognizable by a finite automata. The language REVERSELL $)=\{\mathrm{w} / \mathrm{w}$ is the reverse of $V$ where VEL $\}$ is a
(A) Context free language
(B) Context sensitive language
(C) Regular language
(D) Recursively enumerable language

224 Let $L$ be the set of all binary strings whose last two symbols are same. The number of states in the minimum state deterministic finite 0 state automation accepting $L$ is
(A) 2
(B) 5
(C) 8
(D) 3

Consider the following CFG :
$\mathbf{S} \rightarrow \mathbf{A B} / \mathbf{C A}$
$\mathrm{B} \rightarrow \mathrm{BC} / \mathrm{E}$
$\mathrm{A} \rightarrow \mathbf{a A} / \mathrm{E}$
$\mathrm{C} \rightarrow \mathrm{aB} / \mathrm{b}$
Which of the following string is not derived by above CFG?
(A) aabab
(B) abbab
(C) abbaa
(D) None of the above

226 Which of the following problems is undecidable?
(A) Equivalence problem for FSAs
(B) Finiteness problem for FSAs
(C) Membership problem for CFGs
(D) Ambiguity problem for CFGs

227 A grammar that is both left and right recursive for a non terminal is
(A) Ambiguous
(B) Unambiguous
(C) Information is not sufficient to decide whether it is ambiguous or unambiguous
(D) None of the above

228 A bottom up parser generates
(A) Right most derivation
(B) Right most derivation in reverse
(C) Left most derivation
(D) Left most derivation in reverse

229 The language generated from the grammar with productions $S \rightarrow \operatorname{asb} / \mathbf{s s} / \lambda$ is
(A) Regular
(B) Context free but not linear
(C) Context free
(D) None of the above

230 Which of the following has a read only tape?
(A) Multitape Turing Machine
(B) Offline Turing Machine
(C) Multi-stack Turing Machine
(D) None of the above

231 We say that an algorithm exits for a particular problem when the language for the problem is
(A) Context free
(B) Context sensitive
(C) Recursive enumerable
(D) Recursive

232 Given $x=\{0,1\}$, then which of the following sets is not countable?
(A) Sets of all strings over $x(B)$
(B) Sets of all languages over $x$
(C) Sets of all regular sets over $x$
(D) None of the above

233 Type checking is normally done during
(A) Hexical analysis
(B) Syntax analysis
(C) Syntax directed translation
(D) Code optimization

234 How many tokens are there in following $\mathbf{C}$ statement? (Ignore any blank space, if). printf("i=\%d,\&i=\%x",i,\&i);
(A) 3
(B) 26
(C) 10
(D) 21

235 Which of the following is most powerful parsing method ?
(A) Cannonical LR
(B) $\quad \mathrm{LL}(\mathbf{1})$
(C) SLR
(D) LALR

236 The grammar $A \rightarrow A A|1(A)| E$ is not suitable for predictive parsing because the grammar is
(A) left-recursive
(B) right-recursive
(C) an operator-grammar
(D) ambiguous

237 Which one of the following is a top-down parser?
(A) Operator precedence parser
(B) Recursive descent parser
(C) An LR(K) parser
(D) None of the above

238 Assume that program $P$ has two source modules $M_{1}$ and $M_{2}$ stored in two different files. If $M_{2}$ contains a reference to $M_{1}$ the reference will be resolve at
(A) compile time
(B) load time
(C) Link time
(D) Any of the above

239 Which of the following data structure has minimum access time for symbol table implementation
(A) Linear
(B) Search tree
(C) Self organizing list
(D) Hash table

240 A parse tree showing attribute value at each node is called
(A) Binary Tree
(B) Annotated parse tree
(C) Syntax tree
(D) All of the above

Consider the following grammar.
$\mathrm{S} \rightarrow \mathrm{cAd}$
A $\rightarrow$ ab/ac/a
For input string cad, how many times the recursive decent passer will backtrack?
(A) 2
(B) 3
(C) 4
(D) 5

242 Suppose two productions are there:
$A \rightarrow \alpha$
$A \rightarrow \beta$
The recursive decent parsing without backtracking requires
(A) first ( $\alpha$ ) and first ( $\beta$ ) must be in same set
(B) first $(\alpha)$ and first $(\beta)$ to be disjoint
(C) first $(\alpha)$ and first ( $\beta$ ) must be equal
(D) Data insufficient

243 In each activation of a procedure, the local variable name in that procedure is bound to ___ storage location
(A) same
(B) sometimes different
(C) different
(D) None of the above

244 Inputs to the code generator phase of compiler design are
(A) Code optimizer and symbol table
(B) Intermediate code and optimized code
(C) Intermediate code representation and symbol table
(D) None of the above

245 Local and loop optimization in turn provide motivation for
(A) Preephole optimization
(B) DFA and constant folding
(C) Constant folding
(D) Data flow analysis

246 Consider the following grammar :
$\mathbf{S} \rightarrow \mathbf{s}(\mathbf{s}) \mathbf{s} / \mathbf{E}$
Which of the followings describe the given grammar best?
(A) The grammar is ambiguous
(B) The grammar is unambiguous
(C) The grammar represents all balance string
(D) Both (B) and (C)

247 Consider the following grammar:
$\mathbf{S} \rightarrow \mathbf{S}+\mathbf{S}$
$\mathbf{S} \rightarrow \mathbf{S}$ * $\mathbf{S}$
$S \rightarrow$ id
What can we say about precedence of operators + and *?
(A) + is having higher precedence over *
(B) $\quad *$ is having higher precedence over +
(C) + and * both using same precedence
(D) None of the above

DAG tree is used for
(A) code optimization
(B) code generation
(C) Code cleaning
(D) None of the above

249 Which technique is used for parameter passing in case of in-line expansion?
(A) call by value
(B) call by address
(C) call by reference
(D) call by name

250 Non-preemptive scheduling takes place when
(A) Process terminates
(B) Process switches from running state to waiting state
(C) Both (A) and (B)
(D) None of the above

251 RR scheduling is similar to
(A) Non- preemptive SJF
(B) FCFS with preemption added to switch processes
(C) preemptive-SJF
(D) None of the above

252 Multi-level feedback queue scheduling uses
(A) Aging scheme
(B) Overlay scheme
(C) Paging scheme
(D) None of the above

253 Consider the following 5 processes $P 1, P 2, P 3$, P4 and P5 with their cpu burst time arriving at 0 time in order, what is average waiting time, if FCFS is used ?
Processes : P1, P2, P3, P4, P5
Burst time : 10, 25, 3, 4, 11 (in ms)
(A) 10 ms
(B) 20 ms
(C) $\quad 22 \mathrm{~ms}$
(D) 25 ms

254 Which of the following is false for multiprogramming ?
(A) The response time is shorter
(B) Throughput is increased
(C) Operating system overhead is decreased
(D) All of the above

255 Which of the following is/are not contained in Process Control Blocks
(A) Memory allocation
(B) Stack Pointer
(C) Program counter
(D) Scheduling information

256 Which of the following is false with respect to threads?
(A) Each Thread has its own stack
(B) All the threads in a process have exactly same address space
(C) All the threads in a process share the same global variables
(D) None of the above

257 A computer system has 6 tap drives, with ' $n$ ' processes competing for them. Each process may need 3 tap drives. The maximum value of ' $n$ ' for which the system is guaranteed to be deadlock free is
(A) 1
(B) 2
(C) 3
(D) 4

Which of the following is true for at atomic instruction?
(A) Can be interrupted in middle
(B) Test-and-set is an example of atomic instruction
(C) Can be used for synchronization purpose
(D) Both (B) and (C)

259 Assume that system has ' $r$ ' resources If same type shared by ' $P$ ' processes each of which needs at most ' $n$ ' resources. In which of following case, system is assured to be deadlock free?
I. $r=4, P=3, n=2$
II. $r=2, P=2, n=2$
(A) I only
(B) II only
(C) I and II only
(D) None of the above

260 Compaction is
(A) Freeing the resources to allocate another
(B) Freeing the block to allocate another
(C) Packing all free blocks to create one free block
(D) None of the above

261 If page size is 4 KB and logical address is 22 bit, then the number of entries in page table is,
(A) $\quad 1 \mathrm{~K}$
(B) $\quad 2 \mathrm{~K}$
(C) 3 K
(D) 4 K

262 Inverted page table contains
(A) Only page number
(B) Process-id, page number, offset
(C) Page number and offset
(D) frame number and offset

263 Consider the i-node structure with 20 direct addresses and one indirect address. The i-node contains 20 direct addresses of 4 -bytes each. If all disk blocks are 1 K bytes, determine the largest file size
(A) 256 KB
(B) 276 KB
(C) 1 MB
(D) 4 MB

264 Which of the following is true?
(A) Paging suffers from internal fragmentation
(B) Segmentation suffers from external fragmentation
(C) Segmented memory can be paged
(D) All of the above

265 Consider a machine with 64 MB physical memory and a 32-bit virtual address space. If the page size is 4 KB , how many entries are there in page table?

| (A) | $\mathbf{2}^{\mathbf{1 0}}$ |
| :--- | :--- |
| (B) | $\mathbf{2}^{12}$ |
| (C) | $\mathbf{2}^{\mathbf{2 0}}$ |
| (D) | $\mathbf{2}^{22}$ |

266 Disk scheduling involves
(A) Which disk should be accessed next
(B) The order in which disk access request must be serviced
(C) The physical location where files should be the accessed in the disk
(D) None of the above

267 Which of the following SQL command deletes a table?
(A) DELETE TABLE
(B) DROP TABLE
(C) REMOVE TABE
(D) None of the above

268 Precompiled queries in RDBMS are faster in execution as
(A) Database engine gives them priority
(B) They are stored in special memory
(C) They are compiled once only
(D) All of the above

269 Which of the following is (are element(s) of database in RDBMS ?
(A) Data
(B) Constraints and schema
(C) Relationships
(D) All of the above

270 The attribute or attribute combination of one table whose values are required to match those of the primary key of some other table, is known as
(A) Matching key
(B) Foreign key
(C) Relation key
(D) None of the above

271 Which of the following is not a DDL operation?
(A) Describing table
(B) Deleting a table
(C) Creating a table
(D) Adding a column to a table
$\qquad$ is a stored program that is attached to a table or a view.
(A) pseudofile
(B) embedded select statement
(C) trigger
(D) None of the above

273 Which of the following operation is not related to transactions in DBMS ?
(A) Roll back
(B) Commit
(C) Savepoint
(D) All are related to transactions

274 Which of the following is not a valid aggregate function in SQL ?
(A) COUNT
(B) COMPUTE
(C) SUM
(D) MAX

275 Which statement is used to get all data from the student table whose names starts from $p$ ?
(A) SELECT * FROM student WHERE name LIKE '\%p\%';
(B) SELECT * FROM student WHERE name LIKE 'p\%';
(C) SELECT * FROM student WHERE name LIKE ‘_p\%’;
(D) SELECT * FROM student WHERE name LIKE ‘\%p’;

276 Every binary relation is in $\qquad$ form.
(A) 1NF but not in 2NF
(B) 2NF but not in 3NF
(C) 3NF but not in BCNF
(D) BCNF

277 Find out the set of FDs for the relation $R(A B C D)$ is in 2NF but not in 3NF.
(A) $\quad\{\mathrm{AB} \rightarrow \mathrm{CD}, \mathrm{A} \rightarrow \mathrm{C}, \mathrm{C} \rightarrow \mathrm{D}\}$
(B) $\quad\{\mathrm{AB} \rightarrow \mathrm{CD}, \mathrm{C} \rightarrow \mathrm{D}, \mathrm{DB} \rightarrow \mathrm{AC}\}$
(C) $\{\mathrm{AB} \rightarrow \mathrm{CD}, \mathrm{BC} \rightarrow \mathrm{D}\}$
(D) None of the above

278 Consider relation schema $R$ with set of functional dependencies $(F)$ as :
$\mathbf{R}(\mathbf{A B C D})$ and $\mathrm{F}\{\mathrm{A} \rightarrow \mathrm{B}, \mathrm{B} \rightarrow \mathrm{C}, \mathrm{C} \rightarrow \mathrm{A}\}$
The number of candidate keys is
(A) 1
(B) 2
(C) 3
(D) 4

279 Relationship instances are called
(A) association
(B) aggregation
(C) links
(D) discrimination

280 Lock point of transaction occurs when
(A) Transaction gets first lock
(B) Transaction releases all locks
(C) Transaction gets its final lock
(D) None of the above

281 In the $\qquad$ phase, the system replays updates of all Transactions by scanning the log forward from the last checkpoint.
(A) Redo
(B) Replay
(C) Repeating
(D) None of the above

282 Which of the following is not part of ACID property of transaction ?
(A) Atomicity
(B) Concurrency
(C) Isolation
(D) Durability

283 Which of the following concurrency control protocols ensure both conflict serializability and freedom from deadlock?
(A) Time-stamp ordering
(B) 2-phase looking
(C) Both (A) and (B)
(D) None of the above

284 Which of the following is a not separate layer in TCP/IP model but in OSI model ?
(A) Application
(B) Session
(C) Transport
(D) Network

285 Post address in TCP/IP $\qquad$ consists of bits
(A) 8
(B) 16
(C) 32
(D) 64

286 Which of the following IP address class is used for large number of small networks?
(A) class $\mathbf{A}$
(B) class B
(C) class $\mathbf{C}$
(D) class $\mathbf{D}$

287 Data link layer provides $\qquad$ delivery.
(A) Application to Application
(B) Process to Process
(C) End to End
(D) Point to point

288 For a direct delivery in TCP/IP network, which of the following is true?
(A) Source and destination both are on same network
(B) Source and destination are on different network
(C) Source and destination have same netid
(D) Both (A) and (C)

289 The ARP request is normally
(A) Broadcast
(B) Unicast
(C) Multicast
(D) None of the above

290 Fragmentation of datagram occurs due to
(A) Different network hardware
(B) Smaller MTU
(C) Less bandwidth
(D) None of the above

291 Router using distance vector routing gets information from
(A) From all the hosts
(B) Every router on network
(C) Its neighbor routers
(D) None of the above

292 If class $B$ network has a subnet mask of 255.255.248.0, what is the maximum number hosts per subnet?
(A) 510
(B) 1022
(C) 2048
(D) 2046

293 What is the purpose of Time To Live (TTL) field in IP datagram header?
(A) reduce delays
(B) prevent packet looping
(C) prioritize packets
(D) optimize throughput

294 A four port bridge connects the stations of 10 mbps Ethernet LAN. If average data rate of each station is $\mathbf{1 . 2 5} \mathbf{~ m b p s}$, how many stations are there?
(A) 20
(B) 40
(C) 80
(D) 32

295 In IEEE 802.5 standard if one link is broken
(A) Part of the network will be down
(B) Our associated node will be down
(C) Whole network will be down
(D) None of the above

296 Suppose that a group of 20 stations is served by an Ethernet LAN. If all these stations are connected to $\mathbf{1 0 0 0} \mathbf{~ m b p s}$ switch then how much bandwidth is available to each station?
(A) 1000 mbps
(B) $\mathbf{5 0} \mathbf{~ m b p s}$
(C) 100 mbps
(D) None of the above

297 OSPF is based on
(A) Distance Vector Routing
(B) Link State Routing
(C) Path Vector Routing
(D) None of the above

298 Two important reasons that the Internet is organized as a heirarchy of networks for the purpose of routing are
(A) least cost and maximum free circuit availability
(B) message complexity and speed of convergence
(C) Scale and administrative autonomy
(D) All of the above

299 Slow start and multiplicative decrease both are the solutions of
(A) Silly window syndrome
(B) Congestion control
(C) Leaky bucket
(D) None of the above

300 You are a network administrator and have been assigned the IP address of 201.222.5.0. You need to have 20 subnets with 6 hosts per subnet. What subnet mask will you use ?
(A) $\quad 255.255 .255 .248$
(B) 255.255.255.128
(C) $\quad 255.255 .255 .192$
(D) $\quad \mathbf{2 5 5 . 2 5 5 . 2 5 5 . 2 4 0}$

