Tezpur University Entrance Examination

MODEL QUESTION PAPERS

TEZPUR UNIVERSITY

NAPAAM, TEZPUR

ASSAM, INDIA

INDEX

M. TECH. in INFORMATION TECHNOLOGY

Model questions for Entrance Examination

Total Marks :100 Time :2 hrs

- The question paper consists of three Sections A, B and C.
- Section A consists of 40 multiple choice questions of 1 marks each, section B consists of 15 short questions of 2 marks each and Section C consists of conventional questions on Programming in C of total 30 marks.
- The topics covered in the test are - Programming in C, Computer Organization , Data Structure (in C) , DBMS, Digital Logic, System Software, Operating System and Theory of Computation.
- Answers to the questions should appear in the space provided and nowhere else.
- There will be no negative marks but no partial credit will be given for questions in section A.

SECTION A

(40 multiple -choice questions of 1 mark each)

Q1. Start and Stop bits do not contain any 'information' but are used in serial communication for the following

A. Error detection B. Error Correction

C.Synchronization D. Slowing down the communication

Q2. A page replacement policy is not necessary for

A. Fully associative caches B. Set associative caches C. Directly mapped caches D. Write- through caches

Q3. The number of select input lines in a 8- to -1 multiplexer is-

A.1 B.8 C.256 D. None of these

Q4. In a heap with n elements with the highest element at the root, the 7th highest element can be found in time

A. O (nlog n) B. O (n) C. O(log n) D. O(1)

Q5. Which one of the following permutations can obtained in the output (in the same order) using a stack assuming that the input is the sequence 1,2,3,4,5, in that order?

A. 3,4,5,1,2, B. 3,4,5,2,1 C. 1,5,2,3,4 D.5,4,3,1,2

Q6. Part of a compiler that keeps record of names of variable and their associated attributes /values is known as

A. Parser B. Symbol Table C. Lexical Analyzer D. Intermediate Code

Q7. In SQL, which of the following is not a DDL command

A.RENAME B. REVOKE C. GRANT D. UPDATE

Q8. Which of the following features cannot be captured by CFGs

A. Syntax of if -then-else statement B. Syntax of recursive procedures

C. Whether a variable has been declared before its use D. Variable names of arbitrary length

SECTION B

(15 short questions of 2 marks each)

Q1. Assume that a CPU has only two registers R1 and R2 and that only the following instruction is available.

XOR Ri , Rj ;{ Rj ! Ri Å Rj , for i, j=1,2}

Using this XOR instruction , find an instruction sequence in order to exchange the contents of the Registers R1and R2.

Q2. A binary search tree is generated by inserting in order the following integers-50, 15, 62, 5, 20, 58, 91, 3. The no. of nodes in the left and right subtree of the root respectively is ?

Q3 Suppose you are given an array s[1..n] and a procedure reverse (s,i,j,). Which reverses that order of elements in s between position i and j (both inclusive)? What does the following

sequence do, where 1<=k<n

reverse(s,l,k)

reverse(s,k+l,n)

reverse (s,l,n)

Q4. Give a production grammar for the language L={aibi | i,j >= 1,i!=j}

Q5. Given the following Relational Schema

EMP (emp_no, dept_no,emp_name,salary)

DEPT(dept_no,dept_name,location)

Write SQL query to find all the department names where the number of employees in the department is greater than 500.

Q6. Consider n processes sharing the CPU in RR fashion . Assuming that each process switch takes s seconds. What must be the quantum size q such that the overhead resulting from process switching is minimized, but at the same time each process is guaranteed to get its turn at the CPU at least every t seconds?

SECTION C

(Conventional questions related to programming in C of 30 marks)

Q1 Find the output of the following C programs:

3

a) #include <stdio.h>
void main (void)
{char a=0XAA;
int b;
b=(int)a;
b>>4;
printf(%x,b);
}

b) #include<stdio.h>
4
void main(void)
{int newval(int);
int in [ ]=12, 24, 45, 0};
int i,sum=0;
for(i=0; in[i];i++)
sum+=newval(in[i]);
printf("Sum= =%d", sum);
}
int newval (int x)
{static int div =1;
return(x/div + +);
}

Q2. Write a program to evaluate the following series to 0. 0001% accuracy.
Sin x=x-x3/3!+x5/5!-x7/7!+....

5

Q3. A data file contains 500 positive integers in the range 1 to 25. Write a program that will read the data and print the frequency distribution i. e .the number of times each of the integers occur in the data. 5

P.G. DIPLOMA in TOURISM MANAGEMENT

Model Questions for Entrance Examination

The Written Test consists of the following :

1. Test of GK : 40 marks
2. Test of reasoning : 30 marks 3. Test of English : 30 marks

Total marks : 100 No negative marks for wrong answers Time : 2 hours

General Knowledge :

1. Which is the largest sugercane producing state in India ?
   (a) Bihar (b) Andhra Pradesh (c) Uttar Pradesh (d) Assam
2. Which particular city is known as the "Garden City" of India ?
   (a) Mysore (b) Bangalore (c) Agra (d) Varanasi
3. Mother Teresa arrived in India from Europe in the year
   (a) 1910 (b) 1921 (c) 1929 (d) 1939
4. What is the name of the currency of Russia ?
   (a) Mark (b) Yen (c) Ruble (d) Peso

English : Which of the Phases marked (1), (2) and (3) given below should replace the phrase given in bold in the following sentences.

1. She cooks, washes dishes, does her homework and take relaxing.
   i) relaxing then ii) then relaxes iii) then relaxing iv) take relaxes v) no correction required
2. Fill in the blanks with the help of the alternatives given below

Charles Darwin was ..... (6) ..... to his studies to a point of madness. However, his findings ..... (7) ..... fruits when he got sucess in propagating the evoltionary principles. According to this theory, there is always ..... (8) ..... for existence or the ..... (9) ..... of the fittest. this theory taught man to ..... (10) ..... Himself to his prevailing environment.

Q. 6. (a) Addicted (b) Devoted (c) Given (d) Recommended
Q. 7. (a) Bore (b) Gave (c) Carried (d) Indicated
Q. 8. (a) Efforts (b) Striving (c) Struggle (d) Fight
Q. 9. (a) Life (b) Survival (c) Dominance (d) Destruction

Q. 10. (a) Adapt (b) Adopt (c) Adept (d) Adhere

Reasoning :

1. the age of a man is three times the sum of the ages of his two sons. Five years after, his age will be double the sum of the ages of his sons. The father's present age is

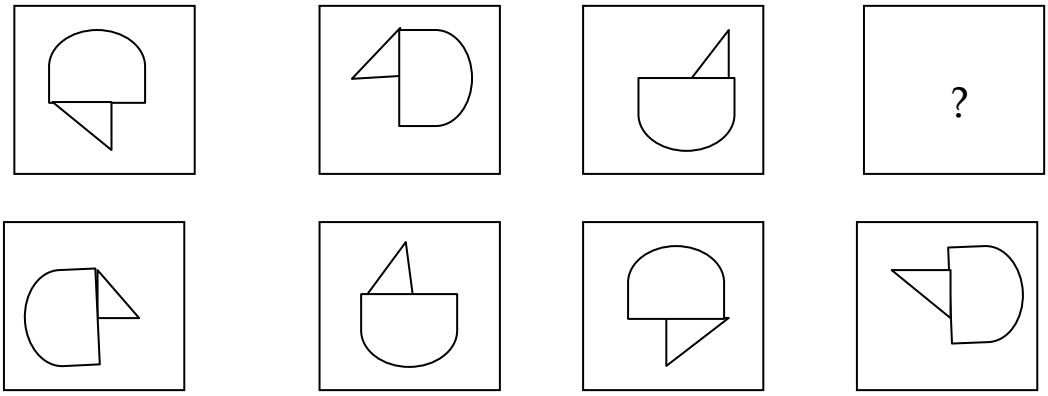
(a) 40 years (b) 45 years (c) 50 years (d) 55 years

2. A town 'P' is located in a particular district. The town 'A' is West of P. Town 'T' is East of 'P'. Town 'K' is East of 'B' but West of 'T' and 'A'. They are all in the same district. Which town is the farther West ?

(a) P (b) K (c) B (d) A

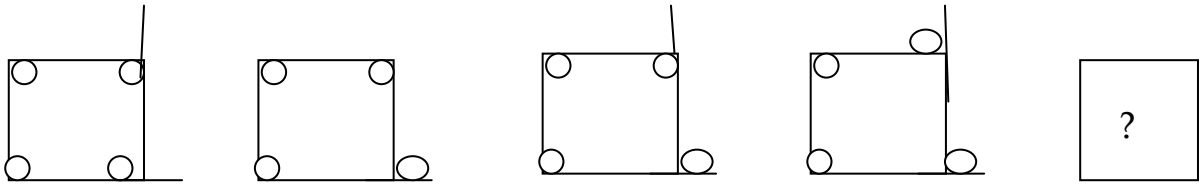
Non-Verbal Reasoning :

1.



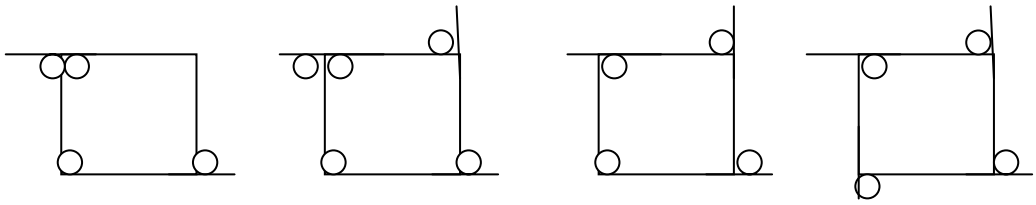
1 2 3 4

2.



I II III IV V

In above set of figures (I) to (IV), some parts are shown to change their positions in a regular direction. Folloing the same sequence, which one of the following will appear at the fifth stage ?



(a) (b) (c) (d)

Answers :

General Knowledge : 1(b), 2(c), 3(a), 4(c), 5(c)

English : 1(2), 6(b), 7 (a), 8(c), 9(b), 10(a)

Reasoning : 1(b), 2(c)

Non-Verbal Reasoning : 1(1), 2(c)

M. A in MASS COMMUNICATION & JOURNALISM

Model Questions for Entrance Examination

Total Marks: 100 Time: 2 hours

Read the following passage and answer the questions given below, based on the text in the passage:

First it was the AXN that was yanked off the air, then it was the FTV's turn over the issue. It is now being hinted plug might be pulled on CNBC Awaaz shortly. This scissor-happy moral policing by the government has goat of several top media watchers, who feel the I&B Ministry is going tad too far in throttling content on television…

Find the meaning of words or phrases in the passage above, and choose the right one from among the choices <u>closest to the textual meaning</u>.

1. Yanked off
   A. Complimented B. Confiscated C. Pulled out D. Punished

2. Scissor-happy
   A. Smile shaped scissor B. Censor Board C. Warning D. Take pleasure in censoring

Find the meaning of words or phrases in the passage above, and choose the one from among the choices <u>most opposite to the textual meaning:</u>

3. Throttling
   A. Free B. Liberal C. Strangulate D. Suffocate

Find the correct meaning of the Idioms and phrases

4. Taxes have been hiked *across the board.*
   A. Tax rise will apply to all
   B. Tax rise decision taken by a board
   C. Tax rise will apply only to cross ownership
   D. Board members have to pay additional taxes

The sequence of the statements is jumbled, except the first and the last. Find the correct order of the sequence from the options given below.

5. ***The next century belongs to India;***
   P) which allows free thinking; the second is demography;
   Q) 55 percent of its population is below 30,
   R) Thanks to its three Ds. India has democracy
   S) young people are innovate; the third is diversity of culture.
   This improves creativity.

   A. RQPS B) RPQS C)RQPS D)RSPQ

Find the suitable answer from among the choices given to complete the following sentences and write answer in the box.

6. He _____ in Guwahati for the last 20 years.
   A. lives B. has been living
   C. is living D. had been living

Find out the error in each of the following sentence. Indicate in which part of the sentence (A,B,C, or D) the mistake occurs.

7. We are working (A)/ in the same office (B)/
   so I can't avoid (C)/ to meet her. (D)

Find the suitable answer from among the choices.

8. Who wrote the book *Everybody Loves a Good Drought*
   A) Mark Tully B) Dileep Padgaonkar C) N. Ram D) P. Sainath

9. A popular digital entertainment gadget iPod is manufactured by
   A) Apple B) IBM C)Intel D) Sony

10. The film *A mighty Heart* starring Angelina Jolie and Brad Pitt is based on American journalist slain in Pakistan in 2002. His name is
    A)Daniel Pearl B) Robert Fisk C) Daniel Lak D) Andrew Whitehead

11. Nacro-analysis investigation is a method of
    A) Using galvanic skin response test B) Using lie detector test
    C) Making subject semiconscious by injecting sodium pentothal D) Using radiation to map the brain

12. Bluetooth is a technology in communication which features
    A. Wireless communication using radio waves B. Wireless communication using infra red rays

C. Wireless communication using micro waves D.Wireless communication using laser

13. The Editor of Shillong Times
A. Manas Choudhury B) B.G Baruah C) Avik Sarkar D) P. Lyndogh

14. Though useless for flying, the wings of the ostrich help the bird
A) Fighting B) standing C) sleeping D) running

15. The part of the Indian Constitution, "We the People of India, having solemnly resolved to constitute India into a Sovereign, Socialist, Secular Democratic Republic and to secure to all its citizens: Justice..Liberty..Equality and Fraternity" is found in
Article 1 B) Directive Principles of State Policy C) Fundamental Rights D) Preamble

16. The largest state in Northeast India in terms of geography is
A. Assam B) Nagaland C) Tripura D) Arunachal Pradesh

17. The VAT (Value Added Tax) has replaced
A) Excise duty B) Sales Tax C) Income Tax D) Indirect Tax

18. Which state celebrates the Hornbill harvest festival in the North East?
A) Manipur B) Mizoram C) Meghalaya D) Nagaland

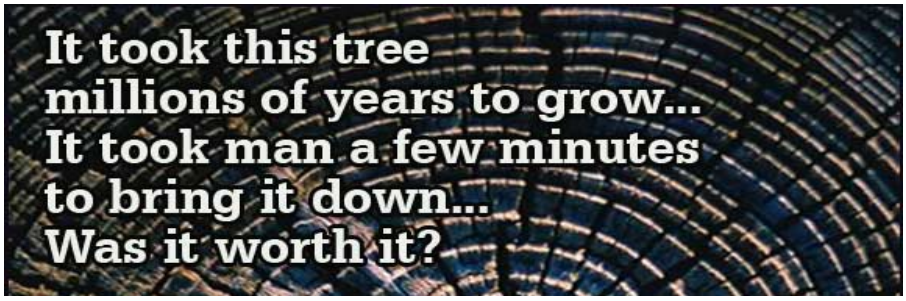
19. Life's Good is the catchline of which of the following brands
A) LG B) HP C) Samsung D) Kodak

Fill in the blank with suitable answer

20.The Australian producer of wildlife documentary titled *Crocodile Hunter, who* died recently was _____

21. Meghalaya featured in Guinness world record last year for their feat in _____

Write an essay not exceeding 350 words based on the picture printed below



Write an essay on the topics given below in not more than 500 words

22. Violence in the society is becoming more and more crude and gory. Are media acting as 'fueler' or spoiler of violence? Discuss.

M.A. in ENGLISH

Model Questions for Entrance Examination

Maximum marks :100 Time allowed: 2 hours

There are 10 questions in all. Ensure that you answer all questions. Please answer all questions in the space provided.

1. Use the correct forms of the verbs given in brackets to complete the following sentences: 2+1=3
   a. If I…. ……..(be) as strong as you, I ……..(kill) you.
   b. If anybody had asked me I ……(can tell) them everything.

2. Use appropriate question tags to complete the following sentences: 1x3=3
   a. You will stay till lunch,……..……..…..?
   b. Don't tell my mother,……?
   c. I love coffee, ……..……..?

3. Fill in the blanks with appropriate words: 5

   I began by arguing……..literature did not exist……..in that case can…….theory exist either? There……two familiar ways in…… any theory can provide ……..with a distinct purpose…….identity. Either it can……..itself in terms of……..particular methods of enquiry,….it can define itself in terms of the particular object that is being enquired into.

4. Correct the following sentences 3

a. The hostel is not suitable for disabled.
b. They are arriving on March the 25th.
c. The train fare is very cheap.

5. Explain the differences in the sense of plum in the two sentences given below: 2

a. I like plum jam very much.
b. She has managed to get a plum job.

6. Choose the appropriate word given in brackets to fill the blanks: 4

a. You should never …….between a husband and wife. (intervene/interfere)
b. We use rice, cereal and vegetables as the …… diet. (staple, stable)
c. I think the politician……..….the crowd to violence. (incited/inspired)
d. Please …….... the posters off the wall. (peal/peel)

7. Develop (in about 200 words) the following outline to write a coherent paragraph, and also suggest an appropriate title. 16

literature – a vague term—different societies, different times, and different notions of literature—some talk of distinction between fictional and factual, imaginative and historical, creative and non-creative etc—some focus on language—literature as a special kind of or use of language—difficult to define precisely—questions of value, attitude, outlook arise---some kind of qualitative judgement involved—some way related to life ,reality, man's response to these—various theories, various assumptions about literature—traditional distinction between literature-non-literature disappearing

8. Write an essay in not more than 250 words on any one of the following topics. 18

a. Theatre of the Absurd
b. Victorian Novel
c. Restoration Comedy

9. Write short notes in not more than 75 words on any five of the following: 5x5=25

sonnet, picaresque novel, neoclassicism, catharsis, metaphor, imagination

10. Read the following poem and answer the questions that follow it:

The Stranglehold of English Lit
Those questions, sister,
Those questions
stand
stab
jab
and gore
too close to the centre!
For if we had asked
why Jane Austen's people
carouse all day
and do no work

would Europe in Africa
have stood
the test of time?
and would she still maul
the flower of our youth
in the south?
Would she?
Your elegance of deceit,
Jane Austen,
lulled the sons and daughters
of the dispossessed
into a calf-love
with irony and satire
around imaginary people.

While history went on mocking
the victims of branding iron
and sugar-plantations
that made Jane Austen's people
wealthy beyond compare!
Eng. Lit. , my sister,
was more than a cruel joke-

it was the heart
of alien conquest.

a. Who is the speaker in the poem? 2
b. What does the reference to Jane Austen suggest? 4
c. What is meant by " history went on mocking"? 4
d. How is irony used in this poem? 5
e. How does English literature becomes a mask of "conquest" in the colonies under British Empire? 6

M. Tech. in ENERGY TECHNOLOGY

Model Questions for Entrance Examination

Maximum Marks : 100 Time : 2 hours

The written test consists of the following sections

A. General Aptitude in Energy	: 50 marks
B. Mathematics	: 20 marks
C. Physics	: 15 marks
D. Chemistry	: 15 marks

SECTION-A
(General Aptitude in Energy)

Choose the correct answer (1 x 50)

1. Which one of the following is a conventional but renewable energy resource?

   a) Oil b) Natural gas c) Coal__ d) Large Hydro ☐

2. Natural gas consists of mainly the following:

   a) Ethane b) Methane c) Propane d) Butane ☐

3. In SI system, unit of energy is_____.

   a) Calorie b) Joule c) Erg d) Btu ☐

SECTION-B
(Mathematics)

Attempt the following (4 x 5)

I. Find $\frac{dy}{dx}$ of $y^x = x^y$.

II. Prove that $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x}\, dx = \frac{\pi}{4}$

SECTION-C
(Physics)

Answer the following (3 x 5)

I. A is a cosmonaut engineer on the International Space station, in a circular orbit around Earth, at an altitude h of 520 km and with a constant speed v of 7.6 km/s. A's mass m is 79 kg. What is his acceleration? (Given Earth Radius, $R_E = 6.37 \times 10^6$ m).

II. You are given a length of uniform heating wire made of a nicke-chromium-iron alloy called Nichrome: it has a resistance R of 72 Ω . At what rate is energy dissipated if a potential difference of 120V is applied across the full length of the wire

SECTION-D
(Chemistry)

Attempt the following (3 x 5)

I. The specific conductance of an N/50 solution of KCL at 25^0C is 0.002765 mho. If the resistance of a cell containing this solution is 400 ohms, what is the cell constant?

II. A petrol engine consumes 25 kg of petrol per hour. The calorific value of petrol is 11.4×10^6 cals. per kg. The power of the engine is 99.75 kW. Calculate the efficiency of the engine

(The format is subject to change)

M. A. in CULTURAL STUDIES

Model Questions for Entrance Examination

Maximum Marks : 100 Time : 2 hours

The Written Test consists of the following :

(i) General information on North East India particularly of Assam.

(ii) Elementary knowledge about the artistic heritage of India with particular emphasis on North East India.

(iii) An essay to be written, on a topic of contemporary and general interest.

Moreover, short answer / objective type questions will be set mostly on General Knowledge relating to Art, History, Culture, Literature, Language, Contemporary events etc.

1. Locate the following spots shown in the map of India supplied herewith :
   (a) Mysore (b) Varanasi
2. Label the names of three SAARC countries in the map supplied.
3. Write an essay on
   (i) 17th FIFA World Cup or (ii) The Computer.
4. Deabbreviate - ISRO, ASEAN.
5. Name the authors of - War and Peace, Mrityunjay.
6. Choose the correct answer :
   (a) Patua menas - scroll painter / glodmith / carpenter.
   (b) Ramcharitnamas was composed by - Madhabdev / Tulsidas / Chaitanyadev.
7. Answer :
   (a) Name one philosopher-scientist of ancient India.
   (b) Name the only Indian recipient of a prize for peace.
8. Choose the right match :

Manipur	Onam
Tamil	Laiharaoba
Kerela	Kuchipudi
Andhra	Pongal

M. Sc. in MOLECULAR BIOLOGY AND BIOTECHNOLOGY

Model Questions for Entrance Examination

Full Mark : 100 Each question carries marks Time : 2 hours

Part A (80marks)

Instruction : Out of the four options, only one is correct and choose the correct answer. Two (2) marks will be awarded for each correct and one (1) mark deducted for each wrong answer.

1. A car weighing 500 kg, working against a resistance of 500 Newton accelerates from the rest to 100 meters at a speed of 20 m/sec. The kinetic energy of the car is –
   a) 5×10^4 Joule b) 10×10^4 joule c) 15×10^4 joule d) 20×10^4 joule
2. The distance between two base pairs of DNA is
   a) 3.4 A^0 b) 34 A^0 c)340 A^0 d) None of these
3. The dimensional formula for latent heat is –
   a) $M^0L^2T^{-2}$ b) $M^1L^2T^{-2}$ c) $M^0L^0T^{-2}$ d) $M^0L^2T^{-1}$
4. Which of the following metals react with H_2O at room temperature?
   a) Ag b) Fe c) Al d) Na
5. Celebral malaria is caused by –
   a) Plasmodium vivax b) P.ovale c) P. falciparum d) P. malariae
6. Antibodies are secreted by
   a) T cells b) B cells c) Plasma cells d) None of the above
7. Prions are infectious particles that are comprised entirely of
   a) DNA b) RNA c) Proteins d) Carbohydrates
8. Given that bacterium has generation time of 0.5 h, starting with an initial inoculum of 2×10^5 the count after 3 h of culture will be
   a) 3.2×10^6 b) 6.4×10^6 c) 12.8×10^6 d) 12.8×10^7
9. Multidrug resistance of an organism may be related to
   a) ability of the organism to efflux the drug b) ability to chemically inactivate the drug
   c)none of the above d) both the above

10. Hospital acquired infections are also called
    a) Emerging infections b) nosocomial infections c) Novel infections d)None of the above
11. Vaccination programs like the polio vaccination drive are aimed at providing
    a) treatment of the disease b) prophylactic measure against the disease c) None of the above
12. In photosynthesis, ATP is synthesized in the
    a) Mitichondrial matrix
    b) The stroma of chloroplast
    c) Between the inner and the outer membranes of the chloroplast
    d) In the thylakoid lumen of chloroplast
13. Apoptosis term is related to
    a) Abnormal cell growth b) Cell death c) Cell morphogenesis d) Cell differentiation
14. which of the following is not true :
    a) Lipids are made up of fatty acids and glycerol.
    b) Lipids are less soluble in water.
    c) All membranes in living cells contain lipids.
    d) Unsaturated fatty acids have higher melting point than saturated fatty acids.
15. Which of the following is not true :
    a) Messelson and Stahl proved semiconservative mode of DNA replication.
    b) Hersey and Chase proved DNA is the genetic material.
    c) Jacob and Monod proved gene regulation in eukaryotes.
    d) t-RNA was initially hypothesized as adaptor molecule by F.H.C. Crick.
16. Adenosine is a :
    a) Purine base b) Pyrimidine base c) Nucleotide d) Nucleoside
17. A mechanism of genetic recombination in bacteria that does not occur in a culture medium containing DNase
    a) Conjugation b) Sexducation c) Transducation d) Transformation
18. Which of the following is not greenhouse gas
    a) CO b) NH_3 c) O_3 d) CH_4

PART B (20 marks)

1. Calculate the molality (m) of a solution of 72.0 g glucose ($C_6H_{12}O_6$) in 1 litre of water.
    2

2. Write the structure of the following :
    3
    a) D-glucose b) Cholesterol c) Isopropyl chloride
3. Describe briefly epinastic banding
    2
4. What is royal jelly, where and why it is produced ?
    3
5. Illustrate the structure of a DNA molecule.
    2
6. Fill up the blank space – 1 x 2 =2
    a) The deficiency of the hormone insulin causes ……..
    b) The RNAs within the nucleolus performing various functions are known as …….
7. Give two advantage of Mother's milk in conferring immune protection to the infant.
8. While magnification and resolution are key issues in microscopy, briefly explain the significance of each in 2-3 sentences.

M. TECH in ELECTRONICS DESIGN & TECHNOLOGY

Model Questions for Entrance Examination

Full Marks : 100 Time: 2 Hours

Instructions:

1. Each question carries equal marks.
2. There will be negative marking of ¼ marks for each wrong answer.

1. For running a D.C shunt motor above its rated speed
    a) armature control is used b) field control is used
    c) both a) and b) are used d) None
2. For a control system to be oscillatory in nature, the roots of the characteristics equations lie

a) on the X-axis b) on the Y-axis
c) on the left half of the co-ordinate plan d) none

3. A 10 k? resistor has to carry a current of 3 mA. Which of the following resistor will be suitable for this.
a) 10 k? , 1/8 Watt b) 10 k? , 1/16 Watt
c) 10 k? , 1/12 Watt d) None

4. The frequency modulated radio frequency range is nearly
a) 2500 – 3000 MHz b) 150 – 200 MHz c) 90 – 105 MHz d) 30 – 70 MHz

5. When a soap bubble is charged
a) it contracts b) it expands c) it does not undergo any change in size d) none of the above

6. Strain gauge, LVDT and thermocouple may be classified as
a) active transducers b) analogue transducers c) primary transducers d) none of the above

7. In hygrometers the principle of measurement is
a) change in resistance of salts with humidity b) change in microwave power using klystron
c) change in thermal conductivity using thermistor d) none of the above

8. Which of the following will serve as a donor impurity in silicon
a) Boron b) Indium c) Germanium d) Antimony

9. By placing an inverter between both inputs of an S-R flip-flop, the resulting flip-flop becomes
a) J-K flip-flop b) D flip-flop c) T flip-flop d) Master slave J-K flip-flop

10. The unit impulse response of a system is given by c(t) = (½) exp(-t/2). It's transfer function is
a) 1/(S+2) b) 1/(2s+1) c) 2/(1+2s) d) None of the above

11. Which of the following device can be used in parallel configuration without the need of any equalizing circuit
a) BJT b) IGBT c) MOSFET d) None

12. Which of the following method is used for correction of power factor in a power electronic circuit
a) Use of static capacitor b) Symetrical angle control
c) Use of synchrounous capacitor d) None

13. A system function Z(s) = [V(s)]/ [I(s)] has a single pole and single zero both on the negative real axis. The pole is at s = -sqrt(3). Given that for I = cos t, the voltage leads the current by 150, the location of the zero is at
a) s = -sqrt(2) b) s = -1 c) s = - [1/sqrt(3)] d) None

14. In the Bode diagram of H(s) = 1 + (s/10) the phase at ? = 10 is
a) 450 b) -450 c) 900 d) None

15. The unit impulse response of a system is given by c(t)=0.5 exp(-t/2). Its transfer function is
a) 1/(s+2) b) 1/(1+2s) c) 2/(1+2s) d) None

16. No eddy current and hysteresis losses occur in
a) Electro-static instruments b) PMMC type instruments c) Moving-iron instruments d) None

17. Creeping is observed in
a) Watt-hour meter b) Power factor meter c) Wattmeter d) None

18. The errors in C.T are mainly due to
a) leakage flux b) excitation emf required c) core loss d) secondary load

19. A CRO uses
a) electromagnetic focussing b) electrostatic focussing
c) both focussing techniques d) no focussing technique

20. Jewels are used in instrument for the purpose of
a) damping b) torque control c) bearing d) none

M. Sc. in APPLIED CHEMISTRY

Model Questions for Entrance Examination

Full marks: 100 Time: 2 hrs

No negative marks for wrong answers

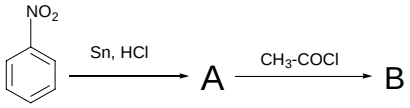
1. The expression $\frac{100+\left(\sqrt{-100}\right)^{100}}{100}$ equals
a) $1+10^{100}i$ b) $1+10^{100}$ c) $1+10^{98}I$ d) $1+10^{98}$

2. The unit for wave number is
a) s^{-1} b) cm^{-1}

c) mole^{-1} d) Joule^{-1}

3. The boiling point of water inside a pressure cooker is
a) below 100^{o}C b) 100^{o}C c) 115^{o}C d) above 130^{o}C
4. What happens when benzene is treated with alkyl halide in the presence of $AlCl_3$ using nitrobenzene as solvent?
5. Halogens are deactivating yet *o-,p-* directing in a electrophilic substitution reaction.
6. Why S_N2 reactions take place much more rapidly in polar aprotic solvents such as DMSO and *N,N*-Dimethylformamide?

7. In the reaction sequence



A and B are _____.

8. Between $Cu(en)_3$ and $Cu(NH_3)_6$, which is more stable and why?
9. Ionization of NO results in decrease in bond length, but ionization of CO increases the bond length. Explain.
10. Explain why in Raman spectra, the stock lines appear in low frequency but with high intensity as compared to the anti - stock lines.
11. Heat capacity of CH_3OCH_3 is 66.5 J /mol K, whereas that of He is only 20.9 J/mol K. Explain why this difference exists?
12. Prove that the commutator for $\hat{x}$ and $\hat{p}_x$ is $i\hbar$.
13. What is degree of polymerization? If the molecular weight of a polymer is 35000 and the molecular weight of a monomer is 35 then what would be the degree of polymerization?

M.Sc in PHYSICS

Model Questions for Entrance Examination

Full marks : 100 Time : 2 hours

Syllabus : ***B.Sc Physics (Honours) syllabus of any Indian University***

- Entrance test has two parts, Part A and Part B of 50 marks each and is of a total duration of 2 hours.
- Part A consists of 50 objective type questions of one mark each. Duration for this part is one hour.
- Part B consists of short descriptive type questions to examine the conceptual clarity and reasoning ability of the candidate. The candidate is required to attempt any 5 questions of 10 marks each out of about 10 given questions.
- Typical questions for Part A and Part B are given below :

PART- A

1. Insert the missing symbol in the nuclear reaction $_7N^{14} + {}_2He^4 \quad {}_1O^{17} + ? \rightarrow$
(a) $_0n^1$ (b) $_{+1}e^0$
(c) $_{-1}e^0$ (d) $_1H^1$

2. Hamiltonian formalism is easier to handle than Lagrangian formalism because Hamiltonian formalism involves
(a) first order differential equations (b) generalized momentum instead of generalized co-ordinates
(c) only cartesian co-ordinates (d) no time derivatives
3. An electric potential field is produced by joint charges 1 μC and 4 μC located at (-2,1,5) and (1,3,-1) respectively. The energy stored in the field is

(a) 2.57 μJ (b) 5.14 μJ (c) 0.28 μJ (d) 20.56 μJ

4. Which of the following directions lie on the plane (III) in the cubic crystal ?
(a) [$11\bar{2}$] (b) [$3\bar{1}\bar{2}$] (c) [101] (d) [001]
5. The vector $2\hat{i} + \hat{j} + \hat{k}$ is perpendicular to $\hat{i} + 4\hat{j} + \lambda\hat{k}$ if λ is equal to
(a) o (b) –1 (c) 2 (d) 3
6. A horizontal ring of redius 'r' spins about its axis with an angular velocity 'w' in a uniform vertical magnetic field of magnitude B.

The emf induced in the ring is

(a) $\pi r^2 wB$ (b) ½ $B r^2 w$ (c) $Br^2 w$ d) 0 (zero)

7. Two identical metal balls with charges +2Q and –Q are separated by some distance, and extent a force F on each other. They are joined by a conducting wire, which is then removes. The force between them will now be

a) F b) F/2 c) F/4 d) F/8

8. An electron is confined in an infinite potential well of width L. The lowest energy of this electron is

a) 0 b) $h^2/ 4 \pi L$ c) $h^2 / 8mL^2$ d) h/ 2mL

9.The moment of ineria of a spherical shell of mass " M" and radius ' R' about its diameter is

a) $\frac{1}{3} MR^2$ b) $\frac{2}{3} MR^2$ c) $\frac{5}{3} MR^2$ d) $\frac{4}{3} \pi r^3$

10. In a sample of radioactive material, what percentage of the initial number active nuclei will decay during one mean life

a) 37 % b) 50% c) 63% d) 100%

PART- B

1. Starting from the Langragian equation, prove that the equation of motion a simple pendulum is

   $\theta + \frac{g}{1} \sin\theta = 0$

   where θ, g and 1 are angular displacement, acceleration due to gravity and length of the string respectively.

2. Find the energy release, if two $_1H^2$ nuclei fuse together to form $_2H^4$ nucleus which the binding energies per nucleon of $_1H^2$ and $_2H^4$ are 1.1 MeV and 7.0 MeV respectively.

3. The electrostatic potential due to a certain charge distribution is given by the expression :
   V (x,y,z) = - ($x^2yz + xy^2z+xyz^2$) volts
   Calculate the electric field and charge density at the point (2,1,3)

4. A half wave rectifier uses load resistor RL=8kW and shunt filter capacitor of 12mF. The sinusoidal input voltage is 20sin 2p50t. The angle of conduction is 400. Assuming the rectifier to be ideal (Rf=0, Rp= ¥) calculate :
   i) dc lad current I_{dc}
   ii) dc output voltage V_{dc}
   iii) ripple voltage V_R
   iv) ripple factor y (cos 40^0= 0.7660)

5. (a) An electron with a velocity 10^7 m/s enters a region uniform magnetic field B=0.1 Tesla the angle between the direction of field and the initial velocity of the electron being 30^0. Find the axial distance the two turns of the helical path.
   (b) A point change of 2 X 10^{-7} c is situated at the centre of a cube of side 0.6 m. Calculate the electric flux through the entire surface.

6. A particular diffraction grating produces an n=2 spectral order at a deviation angle of 30^0 for light with a wavelength of 500nm.
   (a) How many lines per cm does the grating have ?
   (b) If the grating were illuminated with white light, how many orders of the complete visible spectrum would be produced ?

7. The work function of a particular metal in 2.00 e.v.
   a) If the metal is illuminated with monochromatic light having a wavelength of 550nm, what will be the maximum speed of the emitted electron ?
   b) What is the stopping potential ?

M.A./M.Sc. in MATHEMATICS

Model Questions for Entrance Examination

■ The entrance test question paper will consist of two sections: **Section A** and **Section B** of **50 marks each.**
■ The duration of the test will be of **2 hours**.
■ **Section A** will consist of 25 multiple-choice questions (all compulsory) of 2 marks each. In this section, 1 mark will be deducted for each wrong answer.
■ **Section B** will consists of about 15/20 descriptive type questions of 5 marks each. Any 10 questions are to be answered from this section in the blank space provided with the respective questions.

Typical questions for Section A and Section B are given below.

Section A

Choose the correct alternative.

1. $\lim_{x\to 0}\left\{\frac{1}{x}-\frac{\log(1+x)}{x^2}\right\}$ is

(a) 1 (b) 2 (c) 1/2 (d) -1. ☐

2. If the cube roots of unity are 1, ω, ω^2, then the roots of the equation $(x-1)\text{^}3+8=0$ are

(a) -1, $1+2\omega, 1+2\omega^2$ (b) -1, $1-2\omega, 1-2\omega^2$
(c) -2, $-2\omega, -2\omega^2$ (d)) -1, $-1-2\omega, -1-2\omega^2$. ☐

3. If a is a non-identity element in a group G such that inverse of a is a itself, then the order of a is

(a) 1 (b) 3 (c) 4 (d) none of these. ☐

4. The system of equations

$$x+2y-3z=-1$$
$$3x-y+2z=7$$
$$5x+3y-4z=2$$

has
(a) exactly one solution
(b) infinitely many solutions
(c) no solution
(d) none of the above. ☐

5. Which of the following set of vectors is a basis for 3^3 ?
i) {(1,2,3), (3,5,7), (5,8,11)}
ii) {(1,0,1), (0,1,0), (-1,0,1)}
iii) {(1,2,3), (2,3,4), (2,4,6)}

(a) only (*i*) and (*ii*) (b) only (*ii*)
(c) only (*i*) and (*iii*) (d) only (*i*) . ☐

6. The series $\sum \frac{n!\,2^n}{n^n}$ is

(a) convergent (b) divergent
(c) conditional convergent (d) none of the above. ☐

7. The probability of getting two heads by tossing 3 unbiased coins simultaneously is

(a) 1/4 (b) 1/8 (c) 3/8 (d) 1/2. ☐

Section B

1. Let G be a group of order *pq*, where *p* and *q* are prime numbers. Show that every proper subgroup of *G* is cyclic. (Hint: Use Lagrange Theorem).
2. Find the area bounded by the curve $y = x^2$ and $y = 2x$.
3. The edge of a cube is increasing at the rate of 0.5 cm/sec. At what rate is the surface area increasing when the edge of the cube is 10 cm.
4. If *U* and *W* are distinct 4-dimensional subspaces of a vector space *V* of dimension 6, then find the possible dimensions of $U \cap W$.
5. Two particles of mass m_1 and m_2 are connected by a light inextensible string passing over a light smooth pulley at the edge of a smooth horizontal table, m_1 hanging vertically and m_2 lying on the table. Applying the principle of energy find the acceleration of the particles in terms of masses and acceleration due to gravity.
6. Suppose an urn contains 5 white balls and 4 black balls. Ten random draws are made "with replacement". Find the probability of getting 3 white balls.
7. Find the general solution of the differential equation

$$3y + e^x + (3x + \cos y)\frac{dy}{dx} = 0.$$

MASTER OF COMPUTER APPLICATION (MCA)

Model Questions for Entrance Examination

Full Marks : 100 Time : 2 hours

Candidates needs to score minimum qualifying marks in each section.

The entrance examination question paper will contain three sections :

1. Section I (Logical Reasoning) : 40 marks
2. Section II (Mathematics or Computer Basics) : 30 marks
3. Section III (English Composition & Comprehension) : 30 marks

To qualify for selection a candidate must secure at least 20% marks in each of the sections.

Model Questions

Section I

Each correct answer will fetch 2 marks and
for every wrong answer 1 (one) mark will be deducted.

1. What is the next number in the series – 121, 169, 289, 361, 526, _ ?
   (A) 841 (B) 625 (C) 784 (D) 729 (E) none of these

2. The missing letters in the sequence - " _ a b b b _ b _ b a b b " are –
   (A) a, b, b (B) a, a, b (C) b, a, a (D) b, a, b (E) b, b, a
3. TMXK : ULXJ : : WQFY : ?
   (A) VRGX (B) XPGZ (C) XRGX (D) XPGX (E) none of these
4. A cube with all sides painted is divided into small cubes of equal sizes. The edge of a small cube is exactly one-fourth as that of the original cube. Therefore the number of small cubes with only one side painted is –
   (A) 4 (B) 6 (C) 12 (D) 24 (E) 36
5. Himanshu is older than Chittaranjan. Vikas is older than Shridhar. Manik is not as old as Vikas but is older than Chittaranjan. Shridhar is not as old as Chittaranjan. Who is the youngest?
   (A) Himanshu (B) Chittaranjan (C) Shridhar (D) Manik

Questions 6 to 8 are based on the following –

A professor is asked to judge a film contest. There are six films –
X, Y, Z, R, T-Part I and T-Part II. The films will be shown over a six-day period, from Monday to Saturday.
(1) No film is shown more than five times.
(2) Film X is shown every day except Friday and Saturday.

(3) Film R is shown on either Monday or Friday.
(4) Both parts of film T are shown every day except for Monday
(5) when only Part I is shown and Saturday when only Part II is shown.
(6) Film Z is shown on alternate days beginning on Monday.
(7) Film Y is shown on three days in succession between Monday and Friday.
(8) Only one film is shown at a time.
(9) The two parts of film T must be viewed in order and on separate days, though not necessarily on consecutive days.
(10) Film Y and R are both shown on a day on which film X is not shown.
(11) The professor cannot view any film on Thursday.

6. What is the minimum number of films shown on one day ?
(A) none (B) 1 (C) 2 (D) 4 (E) 5

7. What is the maximum number of films which can be viewed on one day ?
(A) 1 (B) 2 (C) 3 (D) 5 (E) 6

8. What is the maximum number of times the professor may view both parts of the film T ?
(A) 2 (B) 4 (C) 8 (D) 10 (E) 14

Section II

In this Section answer questions in either Group A or Group B

Group A

Each correct answer will fetch 2½ marks and for every wrong answer 1 (one) mark will be deducted.

1. A circle passes through the points (0,0), (a,0) and (0,b). The co-ordinates of its centre are –
(A) (a/2, b/2) (B) (b/2, a/2) (C) (a, b) (D) (b, a) (E) none of these

2. The square root of 49 + 20 □ 6 is
(A) 2 □ □ 3 (B) 7 □ □ 3 (C) □ (5 + 2 □ 6) (D) □ (7 – 2 □ 6) (E) none of these

3. The term independent of x in the expansion of $(x^2 - 1/x)^4$ is
(A) 1 (B) -1 (C) 48 (D) 0 (E) none of these

4. If 1/ (b-a) + 1/ (b-c) = 1/a + 1/c then a, b, c are in
(A) AP (B) HP (C) GP (D) HP and GP both (E) none of these

5. If f(x) = Sin[x] / [x] for [x] □ 0
= 0 for [x] = 0
([x] is the largest integer less than or equal to x)
then lim f(x) equals –
x □ 0
(A) 1 (B) 0 (C) -1 (D) 0.81 (E) none of these

6. If the complex numbers Z_1, Z_2, Z_3 represent the vertices of an equilateral triangle such that $| Z_1 | = | Z_2 | + | Z_3 | = 3$ then $| Z_1 + Z_2 + Z_3 |$ is equal to –
(A) □3 (B) 0 (C) 9 (D) 3 (E) none of these

7. The number of solutions of the equation $\sin^4 □ - 2 \sin^2 □ - 1 = 0$ at (-□,□) is-
(A) 4 (B) 2 (C) 0 (D) 2 (E) none of these

Group B

Each correct answer will fetch 2 marks and for every wrong answer 1 (one) mark will be deducted.

1. Assuming normal rules of precedence, the equivalent postfix form of the arithmetic expression
a + b * c / d - e * f is
(A) a + ((b * c) / d) - (e * f) (B) a b c * d / + e f * -
(C) - + a / * b c d * e f (D) a b c d e f + * / - *

2. The 8-bit 2's complement binary representation of -35 is
(A) - 00100011 (B) 11100011
(C) 110111101 (D) 10110001

3. An EPROM with 16-bit address bus and 4-bit data bus contains –
(A) 32 KB (B) 64 KB (C) 256 KB (D) 128 KB

4. Each surface of a disk in hard-disk pack containing 10 double-sided disks has 20 tracks and each track has eight sectors. The number of cylinders in the hard disk is -
(A) 160 (B) 3200 (C) 20 (D) 8

5. The output of the following C program is –

```
main ()
{
        int     i =  10 ;
        for ( i - = 1 ; i  <= 18 ; i ++ )
                printf (" % d", (i % 3 ? i : ++i ));
}
```

(A) -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
(B) 10111314161719
(C) 10 11 12 13 14 15 16 17 18
(D) 101113141617

6. If four processes with individual processing time requirements of 10, 8, 12, 14 respectively, are scheduled in the sequence without being descheduled, then the average turn around time will be –

(A) 25.5 (B) 11 (C) 92 (D) 14.5

7. The output of the following C program is –

```
int f ( int x)
{
        char    i
        for ( i  = 0 ; x ; x  >>= 1 )
                if ( x & 1)
                        i ++;
        return ( (int) i );
}
```

(A) tests if x is very much larger than 1. (B) calculates the square of x.
(C) calculates the number of bits in x. (D) calculates the number of '1' bits in x.

Section III

1. Write a precis in about 50 words for a given passage. 10 marks

2. Comprehension: Read the given passage and answer the set of questions based on it. 10 marks

3. Vocabulary test.. 10 marks

M. Sc. in ENVIRONMENTAL SCIENCE

Model Question for Entrance Examination

The test paper shall have both objectives as well as of short descriptive type questions covering (a) 10 + 2 level science subjects (Biology, Chemistry, and Physics) and (b) Basic concepts of environmental science, environmental pollution, current environmental issues, agro-ecosystems, agro-ecology, agriculture including hill agriculture, weather and climate system**.**

(No negative marking for wrong answer)

Marks: 100 Time: 2 hours

I. Choose the most correct answer and put the corresponding letter **a**, **b**, **c**, or **d** in the box provided against each question (each question carry 1 mark)

1. Which of the following molecule has net dipole moment
   (a) CCl_2 (b) C_2H_2 (c) BF_3 (d) NH_3
2. Identify the vector quantity
   (a) Time (b) Work (c) Heat (d) Electric field
3. Transition of inner electron in Heavy metals results in emission of
   (a) X-ray Photons (b) Visible light (c) Infra red (d) Microwave photons

4. Most of the day-to-day weather activity take place in
   (a) Troposphere (b) Stratosphere (c) ionosphere (d) Masosphere
5. Which of the following is not a volcanic feature
   (a) Fault (b) Sill (c) Dyke (d) Non of the above
6. The end product of glycolysis is
   (a) Acetic acid (b) pyruvic acid (c) malic acid (d) boric acid
7. Blue baby syndrome is caused by
   (a) Iron (b) arsenic (c) nitrate (d) phosphate
8. The hypothalamus is located in
   Lung (c) liver (c) brain (d) pancreas

III. Fill in the blanks (each question carry 1 mark)

9. Leaf spot of rice is caused by a fungus called_____
10. To decrease soil pH_____is applied in soil
11. Whip tail of cauliflower is caused by the deficiency of _____

IV. Answer the following in brief (each question carry 2 to 5 marks)

12. (a) Crop rotation (b) Bio-control of insect (c) Photoperiodism
    (d) Crossing over (e) Vernalization (f) Grafting of fruits tree (g) Plasmolysis
    (h) Plasma membrane structure
13. What are the theories of ascent of Sap?
14. Give a brief account of rice pest
15. What is standard electrode potential? Give its importance
16. The setting sun looks red. Explain

V. Outline the process of Nitrogen fixation by leguminous plant

3

VI. Give a brief account of bacterial leaf blight of rice

2

M.Tech. in BIOELECTRONICS

Model Questions for Entrance Examination

Full Marks 100 Time 2 Hrs

Answer either Part A or Part B

Write the answer in the block provided in CAPITAL letter

Instructions

There will be total 50 questions in each part. Each Question will carry equal marks. There will be negative marking. For every wrong answer1/4th of the marks will be deducted.

Part A

1. In a conventional AM super heterodyne receivers, the detectors employed to extract intelligence include

   A) Peak detectors B) Ratio detectors
   C) Phase locked loops C) Slope detectors

2. In TV systems, the modulation method employed for video and audio signals are
   A) both amplitude modulation B) both frequency modulation
   C) respectively amplitude and frequency modulation
   D) respectively frequency and amplitude modulation
3. In 8085 microprocessor whenever POP H instruction is executed
   A) data bytes in the HL pair is stored in the stack
   B) two data bytes at the top of the stack are transferred to the HL pair
   C) two data bytes at the top of the stack are transferred to the PC
   D) two data bytes from the HL registers that were previously stored on the stack are transferred
   E) back to the HL pair
4. If a mod-6 counter is constructed using 3 flip-flops, the counter will skip
   A) 4 counts B) 3 counts
   C) 2 counts D) none of the above
5. Which of the following is a non-valid BCD code

A) 0111 1001 B) 0101 1011
C) 0100 1000 D) 0100 1001

6. A 555 timer can be used as
   A) an astable multivibrator
   B) a monostable multivibrator
   C) a frequency divider
   D) All of the above

7. In computer terminology 1M Bytes memory means
   A) 1000000 bytes B) 1000024 bytes
   C) 1024000 bytes D) 1048576 bytes

8. The decimal equivalent of the hexadecimal number BAD_{16} is
   A) 111013 B) 5929
   C) 3416 D) 2989

9. D to A conversion technique is
   A) successive approximation B) Weighted resistor technique
   C) Dual slope technique D) single slope technique

10. All digital circuits can be realized using only
    A) EX-OR B) OR
    C) Multiplexers C) Half adders

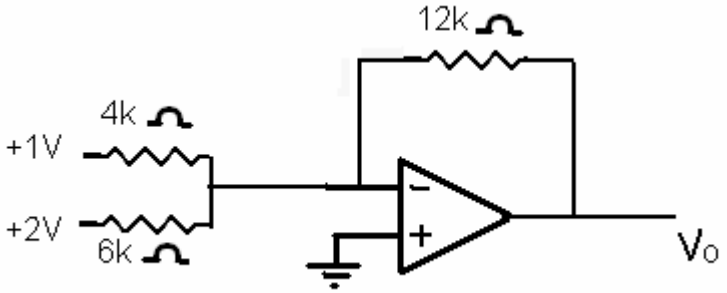
11. Start and stop bits do not contain any information but are used in serial communication for
    A) error detection B) error correction
    C) synchronization D) all of these

12. Ultraviolet radiation is used in IC fabrication process for
    A) diffusion B) masking
    C) isolation D) metallization

13. Consider the following statements:
    Negative feedback in amplifiers results in
    1) reduced voltage gain 2)Reduced band-width
    3) increased SNR 4) reduced distortion
    of these statements:

    A) 1 & 2 are correct B) 1,3 & 4 are correct
    C) 2,3 & 4 are correct D) 1 & 4 are correct

14. In the circuit shown in the figure, the value of output 'Vo' is



    A) +3V B) -3V
    C) -7V D)+7V

15. Echocardiogram is a record of
    A) Ultrasonic measurement in the heart
    B) Heart's electrical activity measured on an electrocardiograph
    C) Ultrasonic measurements in the brain
    D) Neuronal activity of the brain measured on an electroencephalograph

16. Biometrices deals with
    A) Detection of malfunction of biological parameters
    B) Measurement, detection & diagnosis of biological parameters
    C) Measurement of bioelectric potential
    D) Measurement malfunction of human muscles

17. Nerve impulses are carried from the eye to the brain by the
    A) optic nerve
    B) cornea

C) bipolar cells
D) rod and cone cells

Part B

1. Nerve cells maintain a high concentration of Na+ ions outside the cell they do this through:

   (A) Diffusion
   (B) Osmosis
   (C) active transport
   (D) facilitated diffusion
2. The use of antibiotics is a very effective way of destroying pathogenic bacteria (disease causing), but sometimes people do not finish all of their pills. This can result in:
   (A) fewer bacteria
   (B) more bacteria
   (C) bacteria sensitive to the antibiotics
   (D) bacteria resistant to the antibiotics
3. Which blood vessel carries blood with the highest concentration of oxygen:
   (A) aorta (B) pulmonary artery
   (C) pulmonary vein (D) superior and inferior vena cava
4. Which of the following nitrogenous bases is found in DNA but is not found in RNA?
   A) adenine
   B) guanine
   C) cytosine
   D) thymine
5. Which element occurs in nucleic acids?
   A) calcium
   B) phosphorus
   C) manganese
   D) sulfur
6. The chemical properties of an atom are primarily determined by the number of
   A) neutrons it has in its nucleus
   B) isotopes it forms
   C) protons it has in its nucleus
   D) electrons it has in its outermost energy level
7. The taste that most people sense on the back of the tongue is
   A) sweet
   B) bitter
   C) salty
   D) sour
8. In sensory neurons, stimuli are received by the
   A) axons
   B) dendrites
   C) cell body
   D) myelin
9. Grenz rays which are used for treatment of skin are actually
   A) X-rays B) α – rays
   C) β-rays D) cosmic rays
10. The process of impressing the information to be transmitted upon the carrier in RF communication is called
    A) Demodulation B) Modulation
    C) Multiplexing D) None of the above
11. All gases exchanged between air and blood in mammals occurs across the walls of the
    A) trachea
    B) bronchi
    C) alveoli
    D) bronchioles
12. The respiratory control center of humans is located in the
    A) blood-brain barrier
    B) alveoli
    C) erythrocytes
    D) brainstem (medulla oblongata)
13. Which of the following do not have the same number of protons and neutrons?
    A) Carbon-14
    B) Carbon-12

C) Deuterium
D) Oxygen-16

14. If you remove all of the functional groups from an organic molecule so that it has only carbon and hydrogen atoms, the molecule becomes a _____ molecule.
A) carbohydrate
B) carbonyl
C) carboxyl
D) hydrocarbon

15. With respect to galactose, glucose is
A) a stereoisomer
B) a structural isomer
C) not an isomer
D) unrelated except that they are both sugars

16. Animals store glucose in the form of
A) amylose
B) glycogen
C) glycerol
D) guanine

17. The amount of light entering the eye is determined by the size of the
A) retina
B) cornea
C) pupil
D) fovea

ONE-YEAR certificate COURSE IN CHINESE (FULL TIME)

Model Questions for Entrance Examination

Full Marks : 100 Time : 2 hours

Part I - English Grammar

(A) Change the Parts of Speech of the following words as directed in the parentheses: (5x1=5)

1. Strong (into Noun) 2. Suffice (into Adjective)
3. Practical (into Verb) 4. Extend (into Adverb) 5. Destroy (into Noun)

(B) Give the opposite words for the following: (5X1=5)

1. Best 2. Able 3. Visible 4. Management 5. Technical

(C) Change the following Affirmative sentences into Negative ones keeping the meanings intact:

1. Only a kind man can act thus. 2. She is the best in her class.

(5X1=5)

3. Jack is sometimes foolish. 4. Everybody will agree to my opinion.
5. A poor man's life is hard.

(D) Change the following Assertive sentences into Interrogative ones keeping the meanings intact:

1. Everybody loves his country. 2. He was a fool to act thus.

(5X1=5)

3. No one can trust such a liar. 4. I will never forget those happy days in school.
5. It does not matter if he comes.

(E) Choose suitable prepositions from the parentheses to fill up the blanks: (5x 1=5)

1. He is not able to cope _____ the situation. (with/in)
2. Jim is dull_____ Mathematics. (in/at)
3. Elizabeth is engaged_____ Mr. McDonald. (to/with)
4. Jack has brought disgrace _____ his whole family. (for/to)
5. Mr. Smith died _____ illness.(of/by)

(F) Change the Gender of the following nouns:

(5X1=5)

1. Duke 2. Widow 3. Hunter 4. Cow 5. Host

(G) Change the following sentences with the correct form of the verbs given within the parentheses:

1. Mr. Thomson and his family_____ London tonight. (leave) (5x1=5)
2. They _____ John for several months. (see)
3. Ruby _____ here since 1991. (work)
4. Mr. Jones _____ the letter before his friend comes. (write)

5. Simon _____ to Scotland 30 years ago. (go)

(H) Write a letter (in not more than 200 words) - (15)

1. To your friend abroad describing an Indian festival you are fond of.

OR

2. To your father/mother explaining why you want to learn a foreign language.

OR

3. To the editor of a newspaper about the problems of blindly imitating the West.

(I) Write an essay (in not more than 300 words) on any one of the following: (20)

1. Environmental pollution 2. Globalization and India
3. National integration 4. The role of media in the Indian society

(J) Read the following text carefully and answer the questions given below: (10)

It is a matter of common knowledge that in underdeveloped countries such as India with a growing population, there is an unusual pressure on land cultivation. Here, more people are engaged in agriculture partly or wholly than are necessary.

What is the result? When more people are engaged in agriculture than are really needed for the purpose, they are really surplus. If they are withdrawn from the rural areas and put in other occupations and professions it will not mean any decrease in agricultural output. On the other hand, it might increase, as it is said, "Too many cooks spoil the broth". In absolute terms the total volume of rural unemployment is much larger than that of any other country. No wonder, it poses the most challenging problem for the planners to tackle.

1. Suggest a suitable title for the text. 2
2. In which literary category would you classify the text- 2

i. A report ii. A story iii. An advertisement iv. An essay

3. Complete the following sentence with words or phrases that best suit the context. Choose from the alternatives suggested: 3x2=6

i. In India there are many more people engaged in land cultivation than are-

a) demanded b) needed c) expected

ii. "They are really surplus" means-

a) there are too many of them b) they are really useless c) they are really needed

iii. India has the largest number of-

a) unemployed persons in the urban areas
b) unemployed persons in the village areas
c) unemployed persons in the planning department

Part II - General knowledge on China

(K) Answer the questions (any ten): (10x2 =20)

1. What is the staple food of the Chinese people?
2. When was the People's Republic of China founded?
3. Name a famous Chinese poet.
4. Name a great philosopher of China.
5. Name the last dynasty of China.
6. Name one mountain range of China.
7. Name the sea to the east of China.
8. Name three neighbouring countries of China.
9. Name the national animal of China.
10. Which is the longest river of China?
11. Name the Indian Prime Minister who visited China in 1993.
12. Name the Chinese President who visited India in 1996.

M.Sc. in NANOSCIENCE & TECHNOLOGY

Model Questions for Entrance Examination

Full Marks : 100 Time: 2 hrs.

Syllabus: B.Sc. Physics(Hons), Chemistry (Hons) and Biology (Hons) syllabus of any Indian University

- Entrance test has two parts, Part A and Part B of 50 marks each and is of a total duration of 2 hrs.
- Part A consists of 50 objective type questions of one mark each. Duration for this part is one hour.
- Part B consists of short descriptive type questions to examine the conceptual clarity and reasoning ability of the candidate. The candidate is required to attempt any five questions of 10 marks each out of about ten given questions.

Typical questions for Part A and Part B are given below:

PART – A

1. Rutherford's model of the atom fails to explain
   a) the neutral nature of atom
   b) the presence of a positively charged nucleus
   c) the heavy mass of the nucleus
   d) the stability of the atom

2. A field is irrotational if

   a) grade $\vec{A}=0$ b) div $\vec{A}=0$ c) Curl $\vec{A}=0$ d) None of these

3. The relation between two current amplification factors of a transistor is

   $\beta = \alpha/(1+\alpha)$ b) $\beta = (1-\alpha)/\alpha$ c) $\beta = \alpha/(1-\alpha)$ d) $\beta = (1+\alpha)/\alpha$

4. Which of the following electronic configurations correspond to a noble gas

   a) 2, 8, 4 b) 2, 8, 18, 8 c) 2, 8, 18, 7 d) 2, 8, 3

PART – B

1. (a) Show that a free particle cannot absorb a photon completely. (3)

   (b) Explain why is Compton effect experimentally not observed for visible light.

   (c) An X-ray photon is found to have its wavelength doubled on being scattered through 90^o. Find the wavelength and energy of the incident photon. (Compton wavelength of electron = 0.024 A^o). (3)

2. a) Using a d .c and a.c voltmeter to measure the output signal from a filter circuit, we obtain readings of 25 Vd.c and 1.5 V_{rms}. Calculate the ripple of the filter output voltage. (4)

   b) A.d .c voltage supply provides 60 v when the output is unloaded. When connected to a load, the output drops to 56 v. Calculate the values of voltage regulation. (5)

3.(a) Calculate the change in entropy when 50 gm of water at 150^oC is mixed with 80 gm of water at 40^oC. (Specific heat of water 1 cal/gm/^oK) (5)

(b) Calculate the change in the boiling point of water when the pressure is increased from 1.0 to 1.2 atmospheres. Given: Specific volume of steam 1677 cm^3/gm, latent heat of steam = 540 cal/gm, boiling point of water at one atmospheric pressure = 373 ^oK, 1 atmospheric pressure = 1.0×10^5 N/m^2. (5)

4. (a) The average velocity of an ideal gas molecule at 27^0C is 0.3 m/s. Calculate the average velocity at 927^0 c.
   a) The threshold frequency for a surface is known to be 5×10^{14} Hz. What is the wavelength of light required to eject a photo electron having a kinetic energy of 5 cv.? (5)

5. a) What are the basic differences between prokaryotes and eukaryotes ?
   b) What are the two principal chemical components of chromosomes ? Explain how one of these chemical component, act as carriers of genetic information. (5)

M.Tech. in COMPUTATIONAL SEISMOLOGY

Model Questions for Entrance Examination

Full Marks: 100 Time: 2 hours

■ The question paper shall consist of Two Sections: **Section A** and **Section B**.
■ **Section A** shall consist of 25 multiple choice questions (all compulsory) of 2 marks each.
Section B shall consist 25 descriptive type questions
Both sections cover the topics from
1. MATHEMATICS 2. STATISTICS 3. Physics 4. Earth Sciences 5. Engineering
In **Section B**, there will be 5 questions from each subsection **(1 to 5**). In this section candidates can attempt a maximum of 3 subsections and answer any 10 questions of 5 marks each from these 3 subsections only.
■ There will be no negative marks but partial credit will be given for questions in **section B**. Answers to the questions should appear in the space provided and nowhere else.

Section A

(Choose the correct answer using right marks)

1. Let S be the solution space of a set of m homogeneous linear equations with real coefficients in n unknowns. If A is the matrix of this system of equations. Then
(A) dimension of S = n-rank A (B) dimension of S is always n
(C) dimension of S is infinite (D) dimension of S = n+rank A

2. The function $\frac{\sin(z)}{z^2}$ has
(A) pole of order 2 at the origin with residue 1 (B) pole of order 1 at the origin with residue1
(C) pole of order 1 at the origin with residue 2 (D) None of these

3. Given any two events A and B, which of the following statements is not necessarily true?
(A) $P(A) \geq P(A \cap B)$ (B) $P(B) \leq P(AUB)$ (C) $P(A \cap B) \leq P(AUB)$ (D) $P(A)+P(B) \leq P(AUB)$

4. A cricket ball bowled at 140km/hr is straight driven with heavy bat. At the instance of collision, the bat is moving towards the ball with a speed of 10km/hr. If the bat is much heavier than the ball, the speed with which the ball will travel is

(A) 140km/hr (B)160km/hr (C) 130km/hr (D)150km/hr

5. Global warming is due to which of the following?
(A) Green house gases absorb both visible and infrared radiation
(B) Infrared radiation is absorb by Green house gases where as visible radiation is not.
(C) Infrared radiation is not absorb by Green house gases where as visible radiation is.
(D) Earth is slowly coming closer to the sun

6. In an 8bit computer, which of the following number can not be represented
(A) 264 (B) 132 (C) 0 (D) -132

Section B

Subsection: Mathematics

1. Let X and Y be two Banach spaces. Let $<T_n>$ be a sequence of bounded linear operators from X to Y. Let T be an another linear operator define from X to Y such that $T(x)= \lim_{n\to\infty} T_n(x)$. Prove that T is also bounded.

Subsection: Statistics

2. A random sample of size n is available from a bivariate normal population with mean vector (μ_1, μ_2). Develop a test procedure to test the hypothesis $H_0: \mu_1=2\mu_2$ against $H_1: \mu_1 \neq 2\mu_2$.

Subsection: Physics

3. In order to increase the efficiency of a Carnot engine most effectively, would you increase source temperature (T_1) keeping sink temperature (T_2) constant. Or would you decrease T_2 keeping T_1 constant. Explain analytically.

Subsection: Earth Sciences

4. Give a brief account on Global Warming with special reference to North east India.

Subsection: Engineering

5. Find the conversion time of a successive approximation A/D conversion which uses a 2 MHz clock and a 5 bit binary ladder containing 8V reference. What is the conversion rate?

M.A. in SOCIOLOGY

Model Question for Entrance Test

Full Marks : 100 Time : 2 hours

The written test consist of the following:

1. 30 Objective type questions on general knowledge
2. Two short essay type question on issues of socio-economic relevance carrying 10 mark each.
3. Two-essay type question on sociological themes carrying 25 marks each.

1. Deabbreviate the following:
   VAT, AIDS, BTAD

2. Match the following:
   i. The Incas i. Venezuela
   iii. Hugo Chavez iv. Peru
3. Answer the following:
   i. What is the Capital City of Mongolia?
   ii. What is the boundary line between India and Pakistan called?

4. Write shot notes (within 150 words) :
   i. Dowry system ii. Sustainable Development

5. Write essay on the following (within 500 words):
   i. Caste System in India
   ii. Criminalization of Indian Politics

M.Sc. in FOOD PROCESSING TECHNOLOGY

Model Question for Entrance Examination

Full Marks: 100 Time: 2hours

The question paper contains two sections viz. Section A and Section B of 50 marks each. Section A is of objective type and is further divided into two parts viz. Part I of 20 marks from 10+2 PCMB and Part II of 30 marks from Basic Food Chemistry/ Biochemistry/ Nutrition and Processing. Section B is of subjective type and contains 6 questions out of which 5 are to be attempted. Question no 1 and 2 of section B are compulsory.

(No negative marking for wrong answer)

Section: A (Objective)

Part I

Choose the correct answer and put the corresponding letter **a**, **b**, **c**, or **d** in the box provided against each question

1. The term independent of x in the expansion of $(x^2+1/x)^{12}$ is:
   (a) 120 (b) 285 (c) 495 (d) 595
2. What is the formal charge of carbon in CH_4
   (a) 1 (b) 2 (c) 0 (d) 4
3. *E. coli* is a
   (a) Bacteria (b) Fungi (c) Algae (d) Protista
4. In an adiabatic process
   (a) Temperature remains constant (b) Pressure remains constant
   (c) Energy remains constant (d) Volume remains constant

5. Water has the highest density at
(a) 0°C (b) 4°C c) 25°C (d) 100°C
6. The SI unit for temperature is
(a) ° C (b) K (c) °F (d) ° R

Part II

7. The normal blood glucose level/100 ml in human body at fasting state is
(a) 70-90 mg (b) 120-140 mg (c) 50-60 mg (d) 140- 160 mg.
8. The alcohol content in wine is between
(a) 9-14% (b) 18-25% (c) 30-35% (d) 40-50%
9. Which one is called the milk sugar
(a) Maltose (b) Lactose (c) Sucrose (d) Galactose
10. The microorganism most commonly found in spoiled canned food products is
(a) *Clostridium* (b) *Salmonella* (c) *Shigella* (d) None of these
11. The percentage of total production of fruits that goes waste is
(a) 20% (b) 30% (c) 40% (d) 50%

12. Glycogenesis is the
(a) Formation of glucose (b) Formation of glycogen (c) Breakdown of glucose
(d) Breakdown of glycogen
13. 20% m.c. on w.b. will be on d.b.
(a) 50% (b) 25% (c) 15% (d) 10%
14. Degree of unsaturation in oils & fats is measured by
(a) Iodine value (b) Saponification value (c) Acid value (d) All the above

Section B

Attempt any 5 questions (Question no 1and 2 are compulsory):

1. (a) How many milliliters of a 2.0M H_2SO_4 will be required to react with 20 g of NaOH.

(b) Write the principle of paper chromatography

2+3+3+2=10

2. (a) Evaluate $\int \frac{(2\sin x + 3\cos x)}{3\sin x + 4\cos x} dx$

(b) Express $\frac{3x^2 + 11x + 14}{(x-4)(x^2 + 6x + 13)}$ as partial fraction.

3. Define the following 2x5=10
a) Water activity b) Nutrition c) Weaning food d) Gluconeogenesis e) Glycolysis

4. Write the processing methods for-
(a) Wine (b) Butter 5+5=10
5. (a) What is the relevance of microbiology in food processing and preservation?
(b)Write the importance of yeast in foods. 5+5=10