DAY — 01 SEAT NUMBER

2016	VII	09	1030	J - 1	(M)

MARATHI (02)

XII - ~~Arts~~ Sci - July 2016

Time : 3 Hrs. (6 Pages) Max. Marks : 80

प्र. १. खालीलपैकी कोणत्याही एका विषयावर किमान ३०० शब्दांत निबंध लिहा : [१०]

(१) स्वागत करू या मुलीच्या जन्माचे !

(२) पावसाळ्यातील एक दिवस

(३) सूर्य उगवला नाही, तर .....

(४) नापास झालेल्या विद्यार्थ्याचे आत्मकथन

प्र. २. (अ) खालील काव्यवेच्याचे रसग्रहण करा : (६) [१०]

माणसा, समर्थ तू

हस्ति सर्व संपदा, मस्तकात शारदा
असे असून दीनसा, झुरसी काय व्यर्थ तू
माणसा समर्थ तू

वळवशील तू नद्या, नमविशील डोंगरा
अडविशील सागरा, जिंकशील अंबरा
अदम्य आत्मशक्ति ही, विसरसी किमर्थ तू

आत्मनिष्ठ होऊनी, रहा करीत काम तू
उगवतील माणके, गाळताच घाम तू
हातपाय गाळूनी, निमंत्रिशी अनर्थ तू

भाळी हात लाविसी, विसरुनी स्वभाव तू
कार्य जे उभे पुढे, तयास हात लाव तू
पंगु देव, त्यासवे मांड मांड शर्थ तू

चाल, टाक पाऊले, उचल उभय हात तू
भ्यावयास जन्मसी, काय रे जगात तू

हृदयी कृष्ण बोलतो, रणांगणात पार्थ तू
माणसा समर्थ तू

कवी — ग. दि. माडगूळकर

किंवा

(१) खालीलपैकी कोणत्याही एका विषयाशी निगडित सुमारे १५ ते २० ओळींत संवादलेखन करा :

(१) 'ओल्या कचऱ्याचे निर्मूलन' याबाबत आरोग्याधिकाऱ्यांशी संवाद.

(२) 'अभ्यासाचे नियोजन' कसे करावे, याबाबत मित्राशी संवाद.

(२) भाजी मंडईतील भाजीविक्रेतीशी संवाद.

(ब) खालील प्रश्नांच्या उत्तराचा योग्य पर्याय निवडा : (४)

(१) खालील नामासाठी योग्य ते विशेषण ओळखा :

माती

(अ) दमदार (ब) कसदार (क) मजेदार

(ड) बहारदार

(२) खालील शब्दाला समानार्थी शब्द कोणता ते शोधा :

घोडा

(अ) अश्विनी (ब) गाडी (क) तुरग

(ड) वराह

(३) गटात न बसणारा शब्द ओळखा :

(अ) ढग

(अ) वात (ब) जलद (क) मेघ

(ड) घन

(ब) माननीय

(अ) वंदनीय (ब) शोचनीय (क) आदरणीय

(ड) सन्माननीय

प्र. ३. खालील प्रश्नांच्या उत्तरांचे योग्य पर्याय ओळखून लिहा :

(अ) खालील पर्यायांतून निर्दोष शब्द ओळखा : (२)

(१) (य) कोट्याधीश (र) कोट्यधीश
(ल) कोट्यधीष (व) कोट्याधिश

(२) (य) विसंगती (र) विसंगति
(ल) वीसंगती (व) विसगंती

(ब) खालील वाक्प्रचारांच्या अर्थाचा योग्य पर्याय निवडा : (२)

(१) वाडेकोडे बोलणे –
(य) रागाने बोलणे (र) अद्‌वातद्‌वा बोलणे
(ल) भरभर बोलणे (व) लडिवाळपणे बोलणे

(२) पोटात गोळा येणे –
(य) पोटात दुखणे (र) भीती दाटून येणे
(ल) पोट फुगणे (व) पोटात गाठ येणे

(क) (१) खालील वाक्याचे प्रश्नार्थी रूपांतर ओळखा : (१)

वाक्य : अहाहा! स्वाती आज प्रवासाहून घरी येणार!

पर्याय :

(य) स्वाती आज प्रवासाहून घरी आल्याशिवाय राहणार नाही.

(र) स्वाती आज प्रवासाहून घरी आल्याशिवाय राहणार आहे का?

(ल) स्वाती आज प्रवासाहून घरी येणार आहे.

(२) खालील वाक्याचे नकारार्थी रूपांतर ओळखा : (१)

वाक्य : प्राचीन भारत हा ज्ञानाने समृद्‌ध असा होता.

पर्याय :

(य) प्राचीन भारत हा ज्ञानाने असमृद्‌ध होता का?

(र) प्राचीन भारत होता ज्ञानाने समृद्‌धच!

(ल) प्राचीन भारत हा ज्ञानाने असमृद्‌ध असा नव्हता.

(ड) खालील वाक्यांत कोणती विरामचिन्हे वापरता येतील, तो पर्याय निवडा : (२)

(१) **वाक्य :** मनात विचार आला संपलं सगळं

(य) अर्धविराम, प्रश्नचिन्ह

(र) स्वल्पविराम, उद्‌गारवाचकचिन्ह

(ल) अपसारणचिन्ह, उद्‌गारवाचकचिन्ह

(व) स्वल्पविराम, अपूर्णविराम

P.T.O.

(२) **वाक्य :** काय झालं की बाबुरावांना नातू झाला

(य) स्वल्पविराम, पूर्णविराम

(र) अपूर्णविराम, उद्‌गारवाचकचिन्ह

(ल) उद्‌गारवाचकचिन्ह, प्रश्नचिन्ह

(व) स्वल्पविराम, उद्‌गारवाचकचिन्ह

(इ) खालील विधानांत / काव्यपंक्तींत कोणता रस प्रामुख्याने आढळतो, त्यासाठी योग्य पर्याय निवडा : (२)

(१) "मला ते दगड-धोंड्यातून चालवीत नेत होते. पण माझ्यात कण्हण्याचीही ताकद नव्हती."

(य) अद्‌भुत (र) करुण (ल) वीर (व) भयानक

(२) असे तुझ्याशी बोलावे हे
ठरवुन आलो मनात काही;
आणिक तुझिया नेत्री दिसले
बोलायाचे तसे तुलाही.

(य) करुण (र) अद्‌भुत (ल) शांत (व) शृंगार

(फ) खालील पारिभाषिक शब्दांसाठी योग्य पर्याय निवडा : (२)

(१) Bureaucracy

(य) नोकरशाही (र) लोकशाही (ल) हुकुमशाही

(व) बेबंदशाही

(२) Motto

(य) घोषवाक्य (र) मिश्रवाक्य (ल) ब्रीदवाक्य

(व) संयुक्तवाक्य

प्र. ४. (अ) खालीलपैकी कोणत्याही <u>एका</u> प्रश्नाचे उत्तर सुमारे ८० शब्दांत लिहा : (४)

(१) 'विडंबन' ह्या विनोद प्रकाराचे स्वरूप स्पष्ट करा.

(२) तुकारामाने सांगितलेली सोनाराकडे येणाऱ्या भुताची गोष्ट तुमच्या भाषेत थोडक्यात लिहा.

(३) परीक्षेत वीज जाण्याची शक्यता असल्यामुळे मानसीकडून कोणकोणते सराव करवून घेतले गेले?

(ब) खालीलपैकी कोणत्याही <u>तीन</u> प्रश्नांची उत्तरे प्रत्येकी 'एका' वाक्यात लिहा : (३)

(१) गूढोक्ती केव्हा निर्माण होते?

(२) धोतऱ्याने आपल्या लल्लाटी काय लावले?

(३) रश्मीच्या सासूबाईंचे वय किती होते?

(४) चाफा कसली खंत करीत होता?

(५) भुतांच्या दृष्टीने अगदी गैरसोईचे ठिकाण कोणते?

प्र. ५. (अ) खालीलपैकी कोणत्याही दोन प्रश्नांची उत्तरे प्रत्येकी सुमारे ८० शब्दांत लिहा : (८) [१२]

(१) 'मुंबईकर कामगारांचं अवघं लक्ष त्यांच्या कोकणातल्या खेड्याकडे असतं', हे विधान स्पष्ट करा.

(२) लेखिकेला हिराच्या वैभवाचा हेवा का वाटला?

(३) सूनबाईंनी यंत्रमानवाबद्दल सासऱ्यांकडे कोणत्या तक्रारी केल्या?

(४) लेखक आपले घर भाड्याने द्यायला का तयार झाले?

(ब) खालीलपैकी कोणत्याही चार प्रश्नांची उत्तरे प्रत्येकी 'एका' वाक्यात लिहा : (४)

(१) नंदनवनाचा आकार केवढा असतो?

(२) डॉ. कलाम तरुणांना का भेटतात?

(३) मुरुड हे ठिकाण कोकणातील कोणत्या जिल्ह्यात आहे?

(४) लेखक पुलाखालून वाहत जातांना कोणत्या नदीत पोहोचणार होते?

(५) 'ए मेरे वतन के लोगों' हे गीत कोणी गायिले आहे?

(६) बाबुराव हे कोणत्या कंपनीशी संबंधित होते?

प्र. ६. (अ) खालीलपैकी कोणत्याही दोन प्रश्नांची उत्तरे प्रत्येकी सुमारे ८० शब्दांत लिहा : (८) [११]

(१) संत नामदेवांचा प्रपंचाकडे पाहण्याचा दृष्टिकोन कसा व्यक्त झाला आहे?

(२) कवयित्रीने देवाला 'अजब गारोडी' असे का म्हटले आहे?

(३) कामगाराच्या जीवनातील सहचारिणीचे अस्तित्व कवी नारायण सुर्वे यांनी कसे व्यक्त केले आहे?

(४) 'आपण आपले एक छोटे नगर वसवू' असे कवी लोकनाथ यशवंत का म्हणतात?

(ब) खालीलपैकी कोणत्याही तीन प्रश्नांची उत्तरे प्रत्येकी 'एका' वाक्यात लिहा : (३)

(१) मायमातीच्या लेकरांची झुंज कशासाठी आहे?

(२) महात्मा फुले यांचे संपूर्ण नाव लिहा.

(३) जात्याचे दोन खुंटे कोणते आहेत?

(४) स्वातंत्र्याचे डंके कोणत्या पथावर झडले?

(५) घरातील स्त्रीला कोण कोण साद घालते?

प्र. ७. (अ) खालीलपैकी कोणत्याही दोन प्रश्नांची उत्तरे प्रत्येकी सुमारे ८० शब्दांत लिहा : (८)

(१) अग्रलेख आणि बातमी यांतील फरक स्पष्ट करा.

(२) आकाशवाणीवरील बातमी लिहिताना कोणत्या गोष्टींचा विचार करावा लागतो?

(३) दूरचित्रवाणीवरील जाहिरात लेखनात आवश्यक असणारे घटक कोणते?

(४) महाजालावर एखादे संकेतस्थळ सुरू करण्यासाठी कोणकोणती पूर्वतयारी करावी लागते?

(ब) खालीलपैकी कोणत्याही सहा प्रश्नांची उत्तरे प्रत्येकी 'एका' वाक्यात लिहा : (६)

(१) वृत्तपत्रीय लेख म्हणजे काय?

(२) आकाशवाणीचे ब्रीदवाक्य लिहा.

(३) भारतात दूरचित्रवाणीसाठी पहिला प्रक्षेपक कोणत्या कंपनीने बनविला?

(४) 'सोशल नेटवर्किंग'साठी मराठीतील संज्ञा लिहा.

(५) 'धावपळीचे साहित्य' म्हणून कोणत्या लेखनाचा उल्लेख केला जातो?

(६) आकाशवाणीवरील प्रसारणात उद्घोषणा केव्हा दिली जाते?

(७) जाहिरात कलेमध्ये लक्ष्यस्थानी कोण असते?

(८) संकेतस्थळ तयार करण्यासाठी कोणती प्रमाणित भाषा वापरतात?

(९) वृत्तपत्रातील सर्वात महत्त्वाचा संपादकीय लेख कोणता?

(क) खालीलपैकी कोणत्याही एका विषयावर मुलाखतपूर्व तयारी म्हणून प्रश्नावली तयार करा : (४)

(१) राज्यस्तरीय वक्तृत्वस्पर्धेत प्रथम क्रमांक मिळविणाऱ्या विद्यार्थ्याची / विद्यार्थिनीची मुलाखत.

(२) तुमच्या परिसरातील एका रक्तदात्याची मुलाखत.

(३) वृक्षमित्र समितीच्या अध्यक्षाची मुलाखत.

◆◆◆

DAY — 01 SEAT NUMBER

Question Paper Set **B**

2016 | II | 18 | 1100 | **J-701/B** | (E)

ENGLISH - (01)

Time : 3 Hrs. (12 Pages) Max. Marks : 80

SECTION - A

(Reading Skill, Grammar, Vocabulary, Note-making and Summary)

Q. 1. (A) Read the following extract and answer the questions given below : **[15]** **(11)**

So what is a city? It's a dense amalgamation of buildings and people. A city must provide equity and also be sustainable. As an architect who has been closely connected with Delhi and its planning, my wish list is more about the direction we need to take so that future generations don't end up living in chaotic dysfunctional cities.

The first requirement for a city is a pragmatic plan. Many of our cities such as Delhi and Bhubaneswar and even Port Blair in the Andamans have reasonably good master plans. Many also have City Development Plans which have been made an essential requirement to draw funds from the government's Urban Renewal Programme (JNNURM). But they should be updated frequently based on the changing needs of its people.

And let's not forget its citizens – they need to be more pro-actively involved when evolving master plans. But often, there's lack of planning and inadequate implementation systems. This applies to all essential components of a city – streets, public transport system, traffic management, affordable housing, cars and parking, drainage, water supply, sewerage and garbage. Any

deficiency in these will lead to poor quality cities which won't be able to handle the pressure of increased population and changing needs.

The second requirement of a good city is good social infrastructure such as parks and places for leisure such as river and sea fronts. It needs to preserve and protect its heritage. We are a nation with a rich diversity in culture, arts and crafts.

Questions :

(1) What issue is raised in the above extract? (1)

(2) What are the requirements of a good city? (2)

(3) Why is it necessary to update our city development plan? (2)

(4) Do you think unplanned cities make the life of its people miserable? How? (2)

(5) Rewrite the following sentences in the ways instructed :

(i) A city must provide equity and also be sustainable.
(Rewrite the sentence using 'not only ..... but also'.) (1)

(ii) Many of our cities have <u>good master plans.</u>
(Frame a Wh-question to get the underlined part as its answer.) (1)

(iii) It needs to preserve and protect its heritage.
(Identify the tense used in the sentence.) (1)

(6) Find out from the extract the words which mean :

(i) practical (½)

(ii) blend (½)

(B) Grammar :

Do as directed : **(4)**

(i) Rewrite the following sentence by inserting the appropriate articles wherever necessary :
I read interesting story from Mahabharata. (1)

(ii) Rewrite the following sentence using the appropriate prepositions :
One of the things that distinguishes man ..... other animals is the power ..... speech. (1)

(iii) Change the following into indirect speech :
Mother said, "Sunita, what did you buy from the market?"
She said, "I bought a dictionary." (2)

Q. 2. (A) Read the following extract and answer the questions given below : [15] (11)

Researchers recently announced the earth could actually withstand up to 200,000 times the current population. They arrived at this figure by calculating the amount of heat a human body emits, and only at 1·3 million billion would the earth be too hot to be habitable. And though it would feel like being in a can of sardines if that figure were ever reached, the earth is capable of comfortably sustaining a population several times the current 6·5 billion.

In fact, fertility is actually on the decline worldwide. Though population has grown, the rate of growth has fallen sharply. Twenty years ago, the UN projected that population would reach 11·16 billion in 2050, today they say it will reach only 9·37 billion. Moreover, human population will stabilize at about 11·5 billion. While this figure is almost twice the current one, it is hardly claustrophobic.

True, the demands on resources are heavy even now, but this is more due to the manner in which these resources are being used. In fact, figures show that a bigger population does not amount to greater consumption. Over 20% of the world's people in the highest income countries account for 86% of total private consumption expenditure – the poorest 20% a tiny 1·3%. With just 5% of the world's population, the US consumes about 40% of the world's resources. Would you say the US is overpopulated?

Concerns on scarcity of food are equally baseless. In fact, global food production has actually kept up with population growth. If people starve in many countries it is not because food is becoming scarce; it is because those people cannot afford it.

Questions :

(1) What conclusions did the researchers arrive at? (1)

(2) How does the writer explain that the fertility is on the decline? (2)

(3) What does the extract predict about the fear of scarcity of food? (2)

(4) How will population become a gift in the global market scene? (2)

(5) Rewrite the following sentences in the ways instructed :

(i) The earth could withstand upto 200,000 times the current population.

(Rewrite the sentence using the modal auxiliary showing 'certainty'.) (1)

(ii) The earth would be too hot to be habitable.

(Remove 'too' and rewrite the sentence.) (1)

(iii) These resources are being used.

(Rewrite the sentence beginning with, 'We.....') (1)

(6) Write the antonyms of :

(i) habitable (½)

(ii) stabilize (½)

(B) Note-making :

Read the following extract and complete the table given below : **(4)**

Computer Assisted Language Learning (CALL) materials come in two main formats : CD/DVD ROMs and Web-based. Some are tailored to the content to be used in the classrooms whereas others can be used independently. CALL materials allow you to work at your own pace.

Multimedia materials offer you opportunity to take part in other computer-assisted activities, such as text-based gap-filling, multiple choice and text reconstruction activities. Language teachers often develop such text-based CALL activities to accompany a particular course. CALL materials can be regularly updated.

Because CALL learning activity types are usually designed from a template, they can sometimes be repetitive.

A major advantage of CALL materials is that they offer instant feedback on your spoken or written performance. However, such feedback can be limited. If you are more interested in creating

your own responses or elaborating on your ideas, you may find this type of feedback frustrating. Web-based CALL materials can offer more variety through the use of hyperlinks, but feedback is still limited.

Just as representations of the cultures of the target language offered by courses using books; audio and video tapes can perpetuate stereotypes.

Computer Assisted Language Learning Materials		
Formats	Advantages	Disadvantages
..... and Web-based	(a) content tailored for classroom use (b) ..... (c) ..... (d) offer opportunity to take part in other computer-assisted activities (e) ..... (f) ..... (g) offer variety	(i) ..... (ii) limited feedback (iii) ..... (iv) .....

Q. 3. (A) Read the following extract and answer the questions given below : [15] (11)

Chronic floods during the monsoon, on an average, affect more than 30 million Indians annually. Ironically, 60% of India's farmland, 66% of its livestock and its entire forest area depends on rains for survival.

According to a recently released Central Water Commission (CWC) report, on an average, 7·21 million hectares (roughly 72,000 sq. km.) go under floodwater. This water typically ravages 3·78 million hectares of agricultural land, damaging crops worth ₹ 1,118 crore annually.

Heavy rains and floods account for nearly 1,700 lives lost annually. Apart from this, 1·25 lakh houses are annually damaged by torrential rains that also wipe out nearly 96,000 livestock.

Floods are the most recurrent natural calamity, hitting India almost every year. According to the CWC's report on financial

aspects of flood control, anti-sea erosion and drainage projects, it is not possible to provide absolute protection instantly to all flood-prone areas. It says that such an attempt will neither be practical nor economically viable.

The CWC's analysis of floods in India from 1953 to 2011 shows a marginal decline in flood-affected areas over the years, the data shows 1977, 1978 and 1979 were the worst-hit. The 1977 floods killed over 11,000 people, six times the average for the 59 years, between 1953 and 2011. In terms of area and population affected, the floods of 1978 were the most destructive.

In terms of financial loss, recent floods have been far more destructive. The total loss of crops, houses and public utilities in 2009 was ₹ 32,541 crores, the highest for any year.

Questions :

(1) What is the above extract about? (1)

(2) How do floods adversely affect India? (2)

(3) Why is it not possible to provide absolute protection to all flood-prone areas? (2)

(4) How would you help the flood-affected people? (2)

(5) Rewrite the following sentences in the ways instructed :

(i) The floods of 1978 were the most destructive.
(Change the sentence into the 'positive degree'.) (1)

(ii) Floods are the most recurrent natural calamity hitting India almost every year.
(Make it a complex sentence.) (1)

(iii) Floods have been far more destructive.
(Rewrite the sentence using the Simple Present tense.) (1)

(6) Give the meanings of :

(i) entire (½)

(ii) calamity (½)

(B) Write a brief summary of the above extract with the help of the points given below and suggest a suitable title. (4)

Floods – natural, recurrent calamity in India – destroy life and

property – no absolute protection – neither practical nor economically viable – floods in 1977 and 1978.

SECTION - B
(Poetry)

Q. 4. (A) Read the following extract and answer the questions given below : **(4)** **[8]**

If you do not get lowered in your own eyes
While you raise yourself in those of others,
If you do not give in to gossips and lies
Rather heed them not, saying, 'who bothers?'
You may be the person I am looking for.

If you crave not for praise when you win
And look not for sympathy while you lose,
If cheers let not your head toss or spin
And after a set-back you offer no excuse,
You may be the person I am looking for.

Questions :

(1) What should be your reaction towards gossips and lies? (1)

(2) Who are your role models? Why? (1)

(3) Give the rhyming pairs of words from the first stanza. (1)

(4) Which line is repeated in this extract and what is its effect? (1)

(B) Read the following extract and answer the questions given below : **(4)**

Not gold but only men can make
A people great and strong;
Men who for truth and honor's sake
Stand fast and suffer long.

Brave men who work while others sleep,
Who dare while others fly....

They build a nation's pillars deep
And lift them to the sky.

Questions :

(1) What makes a nation strong? (1)

(2) According to you, what makes India a strong and powerful nation? (1)

(3) Write down the rhyme scheme used in the extract. (1)

(4) What does the phrase 'others fly...' mean? (1)

SECTION - C

(Rapid Reading and Composition)

Q. 5. (A) Read the following extract and rewrite it from the point of view of the Daisy, the flower : (4)

[**You may begin as :** I was very happy .....]

How happy the daisy was! No one has the least idea. The bird kissed it with its beak, sang to it, and then rose again up to the blue sky. It was certainly more than a quarter of an hour before the daisy recovered its senses. Half ashamed, yet glad at heart, it looked over to the other flowers in the garden; surely they had witnessed its pleasure and the honour that had been done to it; they understood its joy. But the tulips stood more stiffly than ever, their faces were pointed and red, because they were vexed. The peonies were sulky; it was well that they could not speak, otherwise they would have given the daisy a good lecture. The little flower could very well see that they were ill at ease, and pitied them sincerely.

Shortly after this a girl came into the garden, with a large sharp knife. She went to the tulips and began cutting them off, one after another. "Ugh!" sighed the daisy, "that is terrible; now they are done for."

The girl carried the tulips away. The daisy was glad that it was outside, and only a small flower – it felt very grateful. At sunset it folded its petals and fell asleep, and dreamt all night of the sun and the little bird.

(B) Read the following extract and convert it into a dialogue between Roma and Herman, the narrator in about 8 to 10 sentences : (4)

[You may begin with : (After dinner by the shore at Coney Island Roma and Herman started back by Sid's car.)

Roma : Where were you during the war, Herman?]

The four of us drove out to Coney Island. Roma was easy to talk to, easy to be with. Turned out she was wary of blind dates too! We were both just doing our friends a favor. We took a stroll on the boardwalk, enjoying the salty Atlantic breeze, and then had dinner by the shore. I couldn't remember having a better time.

We piled back into Sid's car, Roma and I sharing the backseat. As European Jews who had survived the war, we were aware that much had been left unsaid between us. She broached the subject. "Where were you during the war?" she asked softly.

'The camps,' I said, the terrible memories still vivid, the irreparable loss. I had tried to forget. But you can never forget.

She nodded. "My family was hiding on a farm in Germany, not far from Berlin," she told me. "My father knew a priest, and he got us Aryan papers."

I imagined how she must have suffered too, fear, a constant companion. And yet here we were both survivors, in a new world.

"There was a camp next to the farm." Roma continued, "I saw a boy there and I would throw him apples everyday".

OR

(B) Read the following extract and extend it by adding an imaginary paragraph of your own in about 120 words :

Frederick had a very famous wrestler, called Charles, in his court. He was champion of the country, and had fought many brave and strong young men. Now, Orlando was a fine wrestler, too, and decided to try his strength against Charles. Charles came to see Oliver about this, asking him to persuade Orlando to give up his idea.

'I am a professional wrestler, sir,' Charles explained to Oliver, 'and I must always fight to win, in order to keep my

reputation. Anyone who fights me runs the risk of being badly hurt. Please warn your younger brother, and persuade him to change his mind.'

But the wicked Oliver thought this was a good opportunity to get rid of Orlando, so he told Charles all kinds of lies about the young man. He pretended that Orlando was bad and ungrateful, and deserved any punishment which Charles could give him. 'I would rather you broke his neck than his finger,' Oliver said, 'and you have my permission to do what you like with the boy.'

SECTION - D
(Written Composition)

Q. 6. (A) Letter Writing : [1

Write any ONE of the following letters : (4)

(1) Write an application in response to the following advertisement using information given in the CV provided :

SITUATION VACANT
Wanted
Smart, English speaking salesman for an electronic showroom. Good salary offered. Experienced candidate will be preferred.
Write giving details to : The Proprietor, Ganesh Electronics, M.G. Road, Solapur.

C. V. (Resumé)			
(1)	Name	:	Suhas Randive
(2)	Age	:	29 years
(3)	Address	:	105, Roshan Apartment, L.T. Road, Pune - 11
(4)	Educational qualification	:	B. A. (First class), Pune Univ.
(5)	Experience	:	3 years' experience of working as a salesman in a textile shop.
(6)	Interests	:	Travelling, photography, reading.

OR

(2) Write a letter to the editor of a newspaper highlighting in it the importance of cleanliness and the need of public participation in the cleanliness drive in your district.

(B) Write on any ONE of the following items as directed : (4)

(1) Write a short tourist leaflet on a place of historical importance with the help of the following points :

(i) How to reach there?

(ii) Where to stay?

(iii) Historical importance of the place.

(iv) Shopping attractions.

(v) Add your own points.

OR

(2) Read the following headlines of news items. Choose any ONE of them and write the dateline, intro and a short continuing paragraph :

(i) 4 killed, 20 injured in a road mishap.

(ii) Auto-rickshaw drivers on strike.

(C) Write on any ONE of the following items : (4)

(1) Read the following tabular data and write a short paragraph regarding 'The vacant seats in the Engineering and Pharmacy colleges' :

Courses	Intake capacity	Vacant seats
Engineering :		
Degree	1,55,102	42,497
Diploma	1,65,413	55,107
Post-graduation	13,651	1,810
Pharmacy :		
Degree	9,712	924
Diploma	12,959	1,771
Post-graduation	5,296	3,506

OR

(2) Write a short paragraph in about 120 words to be used for the Counter-View Section on the following topic :

"Science and technology development have helped us in all walks of life."

You may take help of the following points from the View Section.

View Section
Science and technology development useful for mankind. • has made life comfortable and happy. • life being lengthened. • increased agricultural production. • world is brought closer through various safer and faster communication and transport systems. • modes of entertainment.

Q. 7. Answer the following questions as per instructions :

(A) Imagine you have to interview an old woman who lives in an 'old-age home'. Write a set of 8 to 10 questions for the interview. You may take help of the following points :

- Her family, reasons for being in an old-age home, her feelings and expectations, her advice, etc. (4)

(B) Imagine you have to give a speech on the topic 'India's Changing Villages'. Write a speech on it in about 100 words. (3)

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DAY — 08 SEAT NUMBER

2016	VII	19	1030	J - 79	(E)

MATHEMATICS & STATISTICS (40)
(ARTS & SCIENCE)

Time : 3 Hrs. (7 Pages) Max. Marks : 80

Note : *(i) All questions are compulsory.*

(ii) Figures to the right indicate full marks.

(iii) Graph of L.P.P. should be drawn on graph paper only.

(iv) Answer to every new question must be written on a new page.

(v) Answers to both the sections should be written in the same answer book.

(vi) Use of logarithmic table is allowed.

SECTION – I

Q. 1. (A) Select and write the correct answer from the given alternatives in each of the following sub-questions : **[12]** **(6)**

(i) Inverse of the statement pattern $(p \vee q) \rightarrow (p \wedge q)$ is

(a) $(p \wedge q) \rightarrow (p \vee q)$ (b) $\sim (p \vee q) \rightarrow (p \wedge q)$

(c) $(\sim p \vee \sim q) \rightarrow (\sim p \wedge \sim q)$ (d) $(\sim p \wedge \sim q) \rightarrow (\sim p \vee \sim q)$ (2)

(ii) If the vectors $2\hat{i} - q\hat{j} + 3\hat{k}$ and $4\hat{i} - 5\hat{j} + 6\hat{k}$ are collinear, then value of q is

(a) 5 (b) 10

(c) $\frac{5}{2}$ (d) $\frac{5}{4}$ (2)

(iii) If in ΔABC with usual notations $a = 18, b = 24, c = 30$ then $\sin\frac{A}{2}$ is equal to

(a) $\frac{1}{\sqrt{5}}$ (b) $\frac{1}{\sqrt{10}}$

(c) $\frac{1}{\sqrt{15}}$ (d) $\frac{1}{2\sqrt{5}}$ (2)

(B) Attempt any THREE of the following : **(6)**

(i) Find the angle between the lines
$\bar{r} = 3\hat{i} + 2\hat{j} - 4\hat{k} + \lambda(\hat{i} + 2\hat{j} + 2\hat{k})$ and
$\bar{r} = 5\hat{i} - 2\hat{k} + \mu(3\hat{i} + 2\hat{j} + 6\hat{k})$ (2)

(ii) If p, q, r are the statements with truth values T, F, T, respectively then find the truth value of $(r \wedge q) \leftrightarrow \sim p$ (2)

(iii) If $A = \begin{bmatrix} 2 & -3 \\ 3 & 5 \end{bmatrix}$ then find A^{-1} by adjoint method. (2)

(iv) By vector method show that the quadrilateral with vertices A(1, 2, –1), B(8, –3, –4), C(5, –4, 1), D (–2, 1, 4) is a parallelogram. (2)

(v) Find the general solution of the equation $\sin x = \tan x$. (2)

Q. 2. **(A)** Attempt any TWO of the following : **(6)** [14

(i) Find the joint equation of pair of lines passing through the origin and perpendicular to the lines represented by $ax^2 + 2hxy + by^2 = 0$ (3)

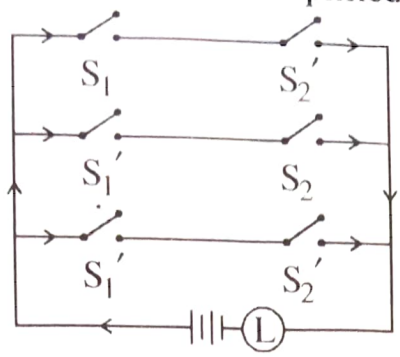
(ii) Find the principal value of $\sin^{-1}\left(\frac{-1}{\sqrt{2}}\right)$ (3)

(iii) Find the cartesian form of the equation of the plane $\bar{r} = (\hat{i} + \hat{j}) + s(\hat{i} - \hat{j} + 2\hat{k}) + t(\hat{i} + 2\hat{j} + \hat{k})$ (3)

(11)

(B) Attempt any TWO of the following : **(8)**

(i) Simplify the following circuit so that new circuit has minimum number of switches. Also draw simplified circuit.



(4)

(ii) A line makes angles of measures 45° and 60° with positive direction of y and z axes respectively. Find the d.c.s. of the line and also find the vector of magnitude 5 along the direction of line. (4)

(iii) Maximize :

$$z = 3x + 5y$$

Subject to : $x + 4y \leq 24$

$3x + y \leq 21$

$x + y \leq 9$

$x \geq 0, y \geq 0$ (4)

Q. 3. **(A)** Attempt any TWO of the following : **(6) [14]**

(i) Find the shortest distance between the lines

$$\frac{x+1}{7} = \frac{y+1}{-6} = \frac{z+1}{1} \text{ and } \frac{x-3}{1} = \frac{y-5}{-2} = \frac{z-7}{1}$$ (3)

(ii) Show that the points $(1, -1, 3)$ and $(3, 4, 3)$ are equidistant from the plane $5x + 2y - 7z + 8 = 0$ (3)

(iii) In any triangle ABC with usual notations prove $c = a \cos B + b \cos A$ (3)

(B) Attempt any TWO of the following : **(8)**

(i) Find p and k if the equation
$px^2 - 8xy + 3y^2 + 14x + 2y + k = 0$
represents a pair of perpendicular lines. (4)

(ii) The cost of 4 dozen pencils, 3 dozen pens and 2 dozen erasers is ₹ 60. The cost of 2 dozen pencils, 4 dozen pens and 6 dozen erasers is ₹ 90 whereas the cost of 6 dozen pencils, 2 dozen pens and 3 dozen erasers is ₹ 70. Find the cost of each item per dozen by using matrices. (4)

(iii) Prove that the volume of the parallelopiped with coterminus edges as $\bar{a}, \bar{b}, \bar{c}$ is $[\bar{a}\,\bar{b}\,\bar{c}]$ and hence find the volume of the parallelopiped with its coterminus edges $2\hat{i} + 5\hat{j} - 4\hat{k}$, $5\hat{i} + 7\hat{j} + 5\hat{k}$, and $4\hat{i} + 5\hat{j} - 2\hat{k}$. (4)

SECTION - II

Q. 4. **(A)** Select and write the correct answer from the given alternatives in each of the following sub-questions : **[12 (6)**

(i) The order and degree of the differential equation

$$\left[1 + \left(\frac{dy}{dx}\right)^3\right]^{\frac{7}{3}} = 7\left(\frac{d^2y}{dx^2}\right)$$ are respectively.

(a) 2, 3 (b) 3, 2
(c) 2, 2 (d) 3, 3 (2)

(ii) $\int_4^9 \frac{1}{\sqrt{x}}\,dx = ...$

(a) 1 (b) -2
(c) 2 (d) -1 (2)

(12)

(iii) If the p.d.f. of a continuous random variable X is given as

$f(x)=\frac{x^2}{3}$ for $-1<x<2$

$=0$ otherwise.

then c.d.f. of X is

(a) $\frac{x^3}{9}+\frac{1}{9}$ (b) $\frac{x^3}{9}-\frac{1}{9}$

(c) $\frac{x^2}{4}+\frac{1}{4}$ (d) $\frac{1}{9x^3}+\frac{1}{9}$ (2)

(B) Attempt any THREE of the following : **(6)**

(i) If $y=\sec\sqrt{x}$ then find $\frac{dy}{dx}$. (2)

(ii) Evaluate : $\int\frac{(x+1)}{(x+2)(x+3)}dx$ (2)

(iii) Find the area of the region lying in the first quadrant bounded by the curve $y^2=4x$, X axis and the lines $x=1, x=4$. (2)

(iv) Solve the differential equation
$\sec^2 x\tan y\,dx+\sec^2 y\tan x\,dy=0$ (2)

(v) Given $X\sim B(n,p)$ if E(X) = 6, Var (X) = 4·2, find the value of n and p. (2)

Q. 5. (A) Attempt any TWO of the following : **(6) [14]**

(i) If the function $f(x)=\frac{(4^{\sin x}-1)^2}{x\cdot\log(1+2x)}$, for $x\neq 0$ is continuous at $x=0$, find $f(0)$. (3)

(ii) Evaluate : $\int\frac{1}{3+2\sin x+\cos x}dx$ (3)

(iii) If $y = f(x)$ is differentiable function of x such that inverse function $x = f^{-1}(y)$ exists then prove that x is a differentiable function of y and $\frac{dx}{dy} = \frac{1}{\left(\frac{dy}{dx}\right)}$, where $\frac{dy}{dx} \neq 0$ (3)

(B) Attempt any TWO of the following : **(8)**

(i) A point source of light is hung 30 feet directly above a straight horizontal path on which a man of 6 feet in height is walking. How fast is the man's shadow lengthening and how fast the tip of shadow is moving when he is walking away from the light at the rate of 100 ft/ min? (4)

(ii) The p.m.f. for X = number of major defects in a randomly selected appliance of a certain type is

X = x	0	1	2	3	4
P(x)	0·08	0·15	0·45	0·27	0·05

Find the expected value and variance of X. (4)

(iii) Prove that $\int_0^a f(x)\,dx = \int_0^a f(a-x)\,dx$

hence evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin x}{\sin x + \cos x} \cdot dx$ (4)

Q. 6. (A) Attempt any TWO of the following : **(6) [14]**

(i) If $y = e^{\tan x} + (\log x)^{\tan x}$ then find $\frac{dy}{dx}$ (3)

(13)

(ii) If the probability that a fluorescent light has a useful life of at least 800 hours is 0·9, find the probabilities that among 20 such lights at least 2 will not have a useful life of at least 800 hours. [Given : $(0{\cdot}9)^{19} = 0{\cdot}1348$] (3)

(iii) Find α and β, so that the function $f(x)$ defined by

$$f(x) = -2\sin x, \text{ for } -\pi \le x \le -\frac{\pi}{2}$$

$$= \alpha \sin x + \beta, \text{ for } -\frac{\pi}{2} < x < \frac{\pi}{2}$$

$$= \cos x, \text{ for } \frac{\pi}{2} \le x \le \pi \text{ is continuous on } [-\pi, \pi]$$ (3)

(B) Attempt any TWO of the following : **(8)**

(i) Find the equation of a curve passing through the point (0, 2), given that the sum of the coordinates of any point on the curve exceeds the slope of the tangent to the curve at that point by 5. (4)

(ii) If u and v are two functions of x then prove that :

$$\int uv\,dx = u\int v\,dx - \int\left[\frac{du}{dx}\int v\,dx\right]dx$$

Hence evaluate $\int x e^x\,dx$ (4)

(iii) Find the approximate value of $\log_{10}(1016)$ given that $\log_{10} e = 0 \cdot 4343$. (4)

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(14)

DAY — 05 SEAT NUMBER

2016	VII	14	1030	J - 48	(E)

CHEMISTRY (55)

Time : 3 Hrs. (8 Pages) Max. Marks : 70

Notes :

(i) All questions are compulsory.

(ii) Figures to the right indicate full marks.

(iii) Use of logarithmic table is allowed.

(iv) Draw well labelled diagrams and write balanced equations wherever necessary.

(v) Answers of both the sections should be written in same answer book.

(vi) Every new question must be started on a new page.

SECTION - I

Q.1. Select and write the most appropriate answer from the given alternatives for each sub-question : [7]

(i) Schottky defects are observed in which solid among the following ?

(a) Brass (b) Cesium Chloride

(c) Zinc sulphide (d) Stainless steel

(ii) 'No machine has an efficiency unity', is stated in –

(a) first law of thermodynamics

(b) second law of thermodynamics

(c) third law of thermodynamics

(d) Hess' law of constant heat summation

(iii) Which among the following reactions is an example of a zero order reaction?

(a) $H_{2(g)} + I_{2(g)} \rightarrow 2HI_{(g)}$

(b) $2H_2O_{2(l)} \rightarrow 2H_2O_{(l)} + O_{2(g)}$

(c) $C_{12}H_{22}O_{11(aq)} + H_2O_{(l)} \rightarrow C_6H_{12}O_{6(aq)} + C_6H_{12}O_{6(aq)}$

(d) $2NH_{3(g)} \xrightarrow{Pt} N_{2(g)} + 3H_{2(g)}$

(iv) Potential of saturated calomel electrode is –

(a) 0·242 V (b) 1·1 V

(c) 0·337 V (d) 0·28 V

(v) Which of the following compounds is used as a semipermeable membrane?

(a) Potassium ferrocyanide

(b) Potassium argentocyanide

(c) Sodium meta aluminate

(d) Copper ferrocyanide

(vi) Which among the following minerals does NOT contain aluminium?

(a) Cryolite (b) Siderite

(c) China clay (d) Corundum

(vii) The group 15 element having inner electronic configuration as of argon is –

(a) Phosphorous (z = 15) (b) Antimony (z = 51)

(c) Arsenic (z = 33) (d) Nitrogen (z = 7)

Q. 2. Answer any SIX of the following : **[12]**

(i) Write chemical reactions involved in Van Arkel method for refining Titanium.

(ii) Explain the relationship between Gibb's standard energy change of the reaction and equilibrium constant.

(iii) A face centred cube (FCC) consists of how many atoms? Explain.

(iv) Describe isolation method in determination of rate law and order of reaction.

(v) Explain the following methods to protect metals from corrosion :

(a) Galvanization

(b) Passivation

(vi) Write the Nernst equation and explain the terms involved.

(vii) What happens when dilute sulphuric acid is treated with (a) Fe (b) CaF_2?

(viii) Define (a) Osmosis (b) Freezing point.

Q. 3. Answer any THREE of the following : **[9]**

(i) The rate constant of a first order reaction are $0{\cdot}58\ S^{-1}$ at 313 K and $0{\cdot}045\ S^{-1}$ at 293 K. What is the energy of activation for the reaction?

(ii) Calculate the standard enthalpy of the reaction,

$2C(\text{graphite}) + 3H_2(g) \rightarrow C_2H_6(g),\ \Delta H^\circ = ?$

from the following ΔH° values

(a) $C_2H_6(g) + \frac{7}{2}O_2(g) \rightarrow 2CO_2(g) + 3H_2O(l)\cdot$

$\Delta H^\circ = -1560\ kJ$

(b) $H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(l)\cdot\ \Delta H^\circ = -285.8\ kJ$

(c) $C(\text{graphite}) + O_2(g) \rightarrow CO_2(g)\cdot\ \Delta H^\circ = -393{\cdot}5\ kJ.$

(iii) 3·795 g of sulphur is dissolved in 100 g of CS_2. This solution boils at 319·81 K. What is the molecular formula of sulphur in solution? The boiling point of CS_2 is 319·45 K.

(Given that K_b for $CS_2 = 2{\cdot}42$ K kg mol^{-1} and atomic mass of S = 32.)

(iv) Write the reactions involved in large scale preparation of Nitric Acid.

Q. 4. Answer any ONE of the following : [7

(i) State third law of thermodynamics. Write applications of standard molar entropy.

Draw neat labelled diagram of electrolytic refining of blister copper.

Determine the density of Cesium chloride which crystallizes in BCC type structure with the edge length 412·1 pm. The atomic masses of Cs and Cl are 133 and 35·5 respectively.

Predict the co-ordination No. of C_s^+ ion if $r_{Cs^+} = 1{\cdot}69$Å and $r_{Cl^-} = 1{\cdot}81$ Å.

(ii) What happens when thin copper leaves are thrown in jar containing chlorine?

H_2O is liquid while H_2S is gas at room temperature. Explain.

The conductivity of 0·02M $AgNO_3$ at 25°C is $2{\cdot}428 \times 10^{-3} \Omega^{-1} cm^{-1}$. What is its molar conductivity?

State Henry's Law.

SECTION - II

Q. 5. Select and write the most appropriate answers from the given alternatives for each subquestion : [7]

(i) Sodium acetate reacts with Ethanoyl chloride to form

(a) Acetic acid (b) Acetone

(c) Acetic anhydride (d) Sodium formate

(ii) Natalite is a mixture of

(a) diethyl ether and methanol

(b) diethyl ether and ethanol

(c) dimethyl ether and methanol

(d) dimethyl ether and ethanol

(iii) What is effective atomic number of Fe (z = 26) in $[Fe(CN)_6]^{4-}$?

(a) 12 (b) 30

(c) 26 (d) 36

(iv) Maltose is a

(a) Polysaccharide (b) Disaccharide

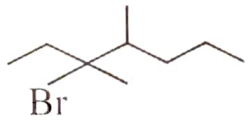
(c) Trisaccharide (d) Monosaccharide

(v) Which one of the following oxidation state of Manganese is unstable?

(a) + 2 (b) + 4

(c) + 5 (d) + 7

(vi) IUPAC name of the following compound is



(a) 3 – Bromo – 3, 4 – dimethylheptane

(b) 3, 4 – dimethyl – 3 – bromoheptane

(c) 5 – Bromo – 4, 5 – dimethylheptane

(d) 4, 5 – dimethyl – 5 – bromoheptane

(vii) Which of the following compounds is NOT prepared by the action of alcoholic NH_3 on alkyl halide?

(a) CH_3NH_2

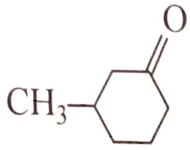
(b) $CH_3 - CH_2 - NH_2$

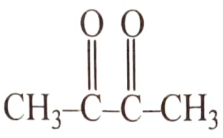
(c) $CH_3 - CH_2 - CH_2 - NH_2$

(d) $(CH_3)_3C - NH_2$

Q. 6. Answer any SIX of the following : [12]

(i) Write IUPAC names of the following compounds :

(a) 

(b) 

(ii) What are the sources of Vitamin C and Vitamin K?

(iii) Write four points of distinction between Lanthanoids and Actinoids.

(iv) How is Benzonitrile converted to Benzophenone?

(v) Write the formulae of the raw materials used for preparation of (a) Buna-S (b) Dextron

(vi) Write a note on Sandmeyer's reaction.

(vii) What is the action of benzene diazonium chloride on
(a) phenol in alkaline medium
(b) Aniline

(viii) Explain any two chemical methods of food preservation.

Q.7. Answer any THREE of the following : [9]

(i) What is the action of following reagents on glucose?
(a) bromine water
(b) dilute HNO_3
(c) hydroxyl amine

(ii) Define ligand. Write four postulates of Werner's theory.

(iii) Write reactions involved in preparation of potassium dichromate from chrome iron ore.

(iv) What is metamerism?

Write the structure and IUPAC name of 'methyl-n-propyl ether.

What is the action of hot HI on it?

Q. 8. Answer any ONE of the following : **[7]**

(i) (a) How are the following polymers prepared?

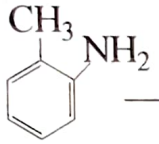
(a) Orlon (b) Teflon

(b) Classify the following drugs into Analgesics and Antibiotics–

(1) Ofloxacin (2) Morphine

(3) Ampicillin (4) Chloramphenicol

(c) Identify 'A' and 'B' and rewrite the reactions.

(1) 

$$\xrightarrow[\substack{HBr\\273K}]{NaNO_2} (A) \xrightarrow{Cu_2Br_2} (B) + N_2\uparrow$$

(2) $H_3C - CH_2 - \underset{\underset{Br}{|}}{CH} - CH_3 \xrightarrow[\substack{KOH\\\Delta}]{Alcoholic} (A) +$

$$(B) + 2KBr + 2H_2O$$

(3) $C_2H_5 - N^{\oplus}(CH_3)_3I^{\ominus} \xrightarrow[\Delta]{Ag_2O/H_2O}$

$$A \xrightarrow{\Delta} B + (CH_3)_3N + H_2O$$

(ii) How are the following conversions carried out?

(1) 2 - methylbutan -1-ol into 2 - methylbutanoic acid.

(2) Phenylethene into Benzoic acid

(3) Benzoic acid into metanitrobenzoic acid.

What is the action of Benzene Sulphonyl Chloride on primary, secondary and tertiary amines?

Write two uses of formaldehyde.

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(18)

DAY — 04 SEAT NUMBER | | | | | | |

2016	VII	13	1030	J - 32	(E)

PHYSICS (54)

Time : 3 Hrs. (8 Pages) Max. Marks : 70

Note : *(i) All questions are compulsory.*

(ii) Neat diagrams must be drawn wherever necessary.

(iii) Figures to the right indicate full marks.

(iv) Use of only logarithmic table is allowed.

(v) All symbols have their usual meaning unless otherwise stated.

(vi) Answers of both sections must be written in the same answerbook.

(vii) Answer to every question must be written on a new page.

SECTION – I

Q. 1. Select and write the most appropriate answer from the given alternatives for each sub-question : [7]

(i) The difference in tensions in the string at lowest and highest points in the path of the particle of mass 'm' performing vertical circular motion is :

(a) 2 *mg* (b) 4 *mg*

(c) 6 *mg* (d) 8 *mg*

(ii) The body is rotating with uniform angular velocity (ω) having rotational kinetic energy (E). Its angular momentum (L) is :

(a) $\frac{2E}{\omega}$ (b) $\frac{E^2}{\omega}$

(c) $\frac{E}{\omega^2}$ (d) $\frac{E}{2\omega}$

(iii) The S.I. unit of compressibility is _____.

(a) $\frac{m^2}{N}$ (b) Nm^2

(c) $\frac{N}{m^2}$ (d) $\frac{kg}{m^3}$

(iv) The working of RADAR is based on _____.

(a) resonance (b) speed of a star

(c) Doppler effect (d) speed of rotation of sun

(v) If two capillary tubes of different diameters are partially dipped in the same liquid vertically, then the rise of liquid _____.

(a) is same in both the tubes.

(b) is more in the tube of larger diameter.

(c) will not be in smaller diameter tube.

(d) is more in the tube of smaller diameter.

(vi) A sonometer wire vibrates with three nodes and two antinodes, the corresponding mode of vibration is _____.

(a) First overtone (b) Second overtone

(c) Third overtone (d) Fourth overtone

(vii) Two gases exert pressure in the ratio 3:2 and their densities are in the ratio 2:3, then the ratio of their R.M.S. velocities is _____.

(a) 2 : 3

(b) 3 : 2

(c) 2 : 1

(d) 1 : 2

Q. 2. Attempt any SIX : **[12]**

(i) Draw a neat labelled diagram showing the various forces and their components acting on a vehicle moving along curved banked road.

(ii) Obtain an expression for critical velocity of a satellite orbiting around the earth.

(iii) Draw a neat labelled diagram of rise of liquid in capillary tube showing different components of tension (force).

(iv) State any four assumptions of kinetic theory of gases.

(v) A tube open at both ends has length 47 cm. Calculate the fundamental frequency of air column. (Neglect end correction. Speed of sound in air is $3{\cdot}3 \times 10^2$ m/s).

(vi) A uniform solid sphere has a radius 0·1 m and density 6×10^3 kg/m^3. Find its moment of inertia about a tangent to its surface.

(vii) A particle executes S.H.M. with a period of 10 seconds. Find the time in which its potential energy will be half of its total energy.

(viii) A stone of mass 2 kg is whirled in a horizontal circle attached at the end of 1·5 m long string. If the string makes an angle of 30° with vertical, compute its period. ($g = 9{\cdot}8$ m/s^2)

Q. 3. Attempt any THREE :

(i) State Kepler's laws of planetary motion.

(ii) Obtain an expression for torque acting on a body rotating with uniform angular acceleration.

(iii) A steel wire having cross-sectional area 2 mm^2 is stretched by 10N. Find the lateral strain produced in the wire.

(Given : Y for steel = 2×10^{11} N/m^2, Poisson's ratio $\sigma = 0{\cdot}29$)

(iv) A body cools from 62°C to 54°C in 10 minutes and to 48°C in the next 10 minutes. Find the temperature of the surroundings.

Q. 4. Explain the formation of stationary wave by analytical method. Show that nodes and antinodes are equally spaced in a stationary wave.

The speed limit for a vehicle on road is 120 km/hr. A policeman detects a drop of 10% in the pitch of horn of a car as it passes him. Is the policeman justified in punishing the car driver for crossing the speed limit?

(Given : Velocity of sound = 340 m/s)

OR

Define practical simple pendulum.

Show that motion of bob of pendulum with small amplitude is linear S.H.M. Hence obtain an expression for its period. What are the factors on which its period depends?

The total free surface energy of a liquid drop is $\pi\sqrt{2}$ times the surface tension of the liquid. Calculate the diameter of the drop in S.I. unit.

SECTION – II

Q. 5. Select and write the most appropriate answer from the given alternatives for each sub-question : [7]

(i) A parallel beam of light travelling in water is incident obliquely on a glass surface. After refraction its width _____.

(a) decreases (b) increases

(c) remains the same (d) becomes zero

(ii) If 'a' is the aperture of telescope and 'λ' is the wavelength of light then resolving power of telescope is _____.

(a) $\frac{\lambda}{1 \cdot 22a}$ (b) $\frac{1 \cdot 22a}{\lambda}$

(c) $\frac{1 \cdot 22\lambda}{a}$ (d) $\frac{a}{1 \cdot 22\lambda}$

(iii) From earth's surface, ionospheric layer of atmosphere lies between _____.

(a) 12 km to 50 km (b) 50 km to 80 km

(c) 80 km to 400 km (d) 400 km to 700 km

(iv) The kinetic energy of emitted photoelectrons is independent of _____.

(a) frequency of incident radiation.

(b) intensity of incident radiation.

(c) wavelength of incident radiation.

(d) collector plate potential.

(v) In hydrogen atom Balmer series is obtained when the electron jumps from _____.

(a) higher orbit to first orbit

(b) first orbit to a higher orbit

(c) higher orbit to the second orbit

(d) second orbit to a higher orbit

(vi) The fraction of the total current passing through the galvanometer is _____.

(a) $\frac{S}{S+G}$ (b) $\frac{G}{S+G}$

(c) $\frac{S+G}{G}$ (d) $\frac{S+G}{S}$

(vii) A meter gauge train is heading north with speed 54 km/hr in earth's magnetic field 3×10^{-4} T. The e.m.f. induced across the axle joining the wheels is _____.

(a) 0·45 mV (b) 4·5 mV

(c) 45 mV (d) 450 mV

Q. 6. Attempt any SIX :

(i) Distinguish between intrinsic and extrinsic semiconductor. (Give any two points).

(ii) Draw the block diagram of a receiver in communication system.

(iii) A point is situated at 6·5 cm and 6·65cm from two coherent sources. Find the nature of illumination at the point, if wavelength of light is 5000Å.

(21)

(iv) Draw the diagrams showing the dipole moments in paramagnetic substance when external magnetic field is (a) absent (b) strong.

(v) A voltmeter has a resistance of 100Ω. What will be its reading when it is connected across a cell of e.m.f. 2V and internal resistance 20Ω?

(vi) The susceptibility of magnesium at 300K is $1{\cdot}2 \times 10^{-5}$. At what temperature will the susceptibility increase to $1{\cdot}8 \times 10^{-5}$?

(vii) What is de Broglie wavelength of an electron accelerated through 25000 volt?

(viii) Draw the schematic symbols for AND, OR, NOT and NAND gate.

Q. 7. Attempt any THREE : **[9]**

(i) Using analytical method for interference bands, obtain an expression for path difference between two light waves.

(ii) State law of radioactive decay. Hence derive the relation $N = N_o e^{-\lambda t}$. Represent it graphically.

(iii) Determine the change in wavelength of light during its passage from air to glass, if the refractive index of glass with respect to air is 1·5 and the frequency of light is 5×10^{14} Hz. Find the wave number of light in glass (velocity of light in air $c = 3 \times 10^8 m/s$).

(iv) Light of wavelength 3000Å falls on a metal surface having work function 2·3 eV. Calculate the maximum velocity of ejected electrons.

(Planck's constant $h = 6 \cdot 63 \times 10^{-34}$ J.s., Velocity of light $c = 3 \times 10^{8}$ m/s, mass of an electron $= 9 \cdot 1 \times 10^{-31}$ kg)

Q. 8. What is electromagnetic induction? [7

Prove theoretically $e = -\frac{d\phi}{dt}$

A potentiometer wire has length of 2m and resistance 10Ω. It is connected in series with resistance 990Ω and a cell of e.m.f. 2V. Calculate the potential gradient along the wire.

OR

With the help of a neat diagram, describe the construction and working of van de Graff generator.

A moving coil galvanometer has a resistance of 25Ω and gives a full scale deflection for a current of 10mA. How will you convert it into a voltmeter having range 0 – 100 V?

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(22)

DAY — 07 SEAT NUMBER W 0 0 0 2 3 4

2016	VII	18	1030	J - 69	(E)

BIOLOGY (56)

Time : 3 Hrs. **(7 Pages)** **Max. Marks : 70**

Note : *(1) All questions are compulsory.*

(2) Draw neat and labelled diagrams wherever necessary.

(3) Figures to the right indicate full marks.

(4) Answers to the questions in Section-I and Section-II should be written in two separate answer books.

(5) Questions from Section-I attempted in the answer book of Section-II and vice-versa will not be assessed / not be given any credit.

(6) Answer to every new question must be started on a new page.

SECTION – I
[BOTANY]

Q. 1. Select and write the most appropriate answer from the given alternatives for each sub-question : [7]

(i) Genotype of human blood group 'O' will be _____ .

(a) $I^A I^A$

(b) $I^A I^B$

(c) *ii*

(d) $I^A i$

(ii) 'Cry' genes are present in _____ .

(a) *Agrobacterium tumefaciens*

(b) *Bacillus thuringiensis*

(c) *Rhizobium species*

(d) *Escherichia coli*

(iii) 'Tropane' is obtained from _____ .

(a) *Daucus carota*

(b) *Catharanthus roseus*

(c) *Datura stramoneum*

(d) *Mentha piperata*

(iv) Which of the following vitamins is not fat soluble?

(a) Vitamin A

(b) Vitamin B

(c) Vitamin D

(d) Vitamin K

(v) How many meiotic divisions are required to produce 200 seeds?

(a) 50

(b) 100

(c) 200

(d) 250

(vi) Energy flow in ecosystem is _____ .

(a) reverse

(b) unidirectional

(c) bidirectional

(d) multidirectional

(vii) Endosperm of angiosperm is _____ .

(a) haploid

(b) diploid

(c) triploid

(d) tetraploid

Q. 2. **(A)** Answer in 'one' sentence only : (6) **[12]**

(i) What is Bacteriophage?

(ii) What is emasculation?

(iii) What is VAM?

(iv) What is the role of decomposers in an ecosystem?

(v) Name any two edible mushrooms.

(vi) What is ecological succession?

(B) Sketch and label the 'Ultrastructure of Mitochondrion'. (2)

(C) Answer the following (Any TWO) : (4)

(i) Give the floral adaptations for anemophily.

(ii) Name any two antibiotics with their microbial source.

(iii) Describe the formation of helobial endosperm.

(iv) Give the hazardous effects of agrochemicals.

Q. 3. **(A)** Answer the following (Any TWO) : (6) **[9]**

(i) Explain incomplete dominance with suitable example.

(ii) What are transgenic plants? Explain with any two examples.

(iii) Explain micropropagation and somatic hybridization.

(B) Sketch and label stages in development of angiospermic female gametophyte from functional megaspore. (3)

Q. 4. Give the central dogma of protein synthesis. Explain the process of translation.

OR

What is dark reaction in photosynthesis? Describe C_3 Pathway.

SECTION – II

[ZOOLOGY]

Q. 5. Select and write the most appropriate answer from the given alternatives for each sub-question :

(i) Vermiform appendix is an example of _____ organ.

(a) vestigeal

(b) homologous

(c) sense

(d) analogous

(24)

(ii) In which of the following disorders number of chromosomes present is 47 ?

(a) Turner's syndrome.

(b) Cushing's syndrome.

(c) Acquired Immuno - Deficiency Syndrome.

(d) Down's syndrome.

(iii) Human blood clotting factor VIII is used to treat _____.

(a) pituitary dwarfism

(b) diabetes mellitus.

(c) haemophiliacs

(d) cystic fibrosis

(iv) A person suffering from diabetes insipidus shows _____ .

(a) hyperglycemia

(b) hypoglycemia

(c) polyuria

(d) hypertension

(v) Photoreceptor cells are present in _____ .

(a) blind spot

(b) retina

(c) cochlea

(d) cornea

(vi) 'HAART' is suggested for the treatment of _____ .

(a) malaria

(b) cancer

(c) AIDS

(d) high chloesterol level

(vii) For DNA fingerprinting radioactive probe obtained from _____ is used in India.

(a) Banded Krait

(b) King Cobra

(c) Viper

(d) Rat snake

Q. 6. (A) Answer in 'one' sentence each : (6) **[12]**

(i) Give any two examples of commensalism.

(ii) What is the common name of *Apis mellifera*?

(iii) Which growth hormone is used to enhance dairy productivity?

(iv) Define Linkage.

(v) Name of two classes to which *Archaeopteryx* acts as connecting link.

(vi) Define the term natality.

(B) Sketch and label Malpighian body. (2)

25

(C) Attempt any TWO of the following : (4)

(i) Enlist any four sequential evolutionary names of human ancestors.

(ii) Give the significance of transgenic animals for betterment of life.

(iii) Give the economic importance of lac.

(iv) Give the fate of mesoderm.

Q. 7. (A) Attempt any TWO of the following : (6) **[9]**

(i) Explain the mechanism of sex determination in birds.

(ii) Give any two unique features of acquired immunity.

(iii) With the help of pyramid, describe the growing population.

(B) Sketch and label reflex arc. (3)

Q. 8. Explain the process of early cleavage till the formation of morula. **[7]**

OR

Describe five types of leucocytes, with the help of diagrams. Add a note on their functions.

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